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The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 3.] JANUARY 16, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Scientific Officer has gone to Madras for a few days to attend the Science Congress Meeting there and will read a paper. He will be returning to headquarters to-morrow probably. He gives in his article a short notice of what may be expected, and in this article gives an analysis of a sample of fish manure recently received.

A short account of a Committee Meeting of the Shevaroy Planters' Association is published with a list of donors of gifts of coffee to the troops at the Front.

Some time ago, a circular was sent round explaining, how best, gifts of tea and coffee could be sent direct to the troops, without breaking bulk at Bangalore.

A note is published giving in a table the exports of rubber from the Amazon Basin *via* Para.

Finance and Industry are so interwoven that an article on the London Produce Markets is reproduced from the *Tropical Life*, and from the *India Rubber Journal* we extract a note by Dr. Philip Schidrowitz on the Packing of Plantation Rubber.

Mr. Guy Turner comments on Mr. Martins's letter under the head of Accountancy and hopes that it will lead to some discussion in these columns.

Brains in Agriculture shows that the present day agriculturist must be an epitome of all scientific knowledge.

From the *India Rubber Journal* we publish an article "The Rubber Outlook" from the standpoint of the ordinary shareholder, and after very carefully considering the question in all its bearings the writer "is not unhopeful of the future."

Our correspondence columns contain two letters—one from Mr. Gerrard Rogers on "Spraying for Green Bug" in which he gives a solution to be used in brushing which has been found effective.

To those who are interested in the Increased British Taxes, if a rebate is to be asked for under the conditions of the letter, we strongly recommend that Mr. Montague be approached.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Fish Manure.

A sample of Fish manure sent by a planter has been recently examined in the laboratory. Its analysis was as follows :—

* Organic matter	55·23
Insoluble matter	31·78
† Soluble Ash	12·99
	100 00
* Containing Nitrogen	4·61
† Containing Phosphoric Acid ...	6·26

We have often pointed out that it does not pay to buy these low grade fertilisers as a rule when the cost of transport to the estate is heavy. The value of this fish is about Rs.32-13-0 as compared with the ordinary milled fish guaranteed to contain 7% of Nitrogen and 7% of Phosphoric Acid, but this takes no account of the loss due to the large proportion of sand, or insoluble matter.

In every ton of this fertiliser bought there are 712 lbs. of sand, or nearly 6 $\frac{1}{3}$ cwts, which is useless material and costs money to transport. Or put in another way if the cost of transport per ton to the estate is Rs.10, for every ten rupees paid for cartage Rs.3/2 is wasted on carrying useless material.

Since Firms say that it is impossible to guarantee ordinary fish manure to contain less than 5% of sand, it is better to buy only Fish Guano which seldom contains more than 2% of insoluble matter. This though costing much more gives better value for the money. Of course, if the cost of transport is very small it may pay to buy the low grade material, but this is seldom the case where estates are concerned.

The Science Congress in Madras.

The Planting Expert will take advantage of the Pongul Holidays to attend the meeting of the Science Congress to be held in Madras on 14-16 January. This Congress was organised last year and the first meeting was held last cold weather in Calcutta. The object of the Congress is to establish in India an Association similar to the British Association at home.

The Agenda is rather a disappointing one as far as the Agricultural and Applied Science Section is concerned, but there are some papers down to be read which should prove of great interest, among others one by Dr. L. C. Coleman on the Black Rot of Coffee caused by *Hypochus* (*Pellicularia Koleroga*, Cooke). The chairman of this Section is Dr. Harold Mann whose address will be, as would be expected, on the subject of the Lines of Development of Indian Agriculture.

In the Botanical Section, the Chairman, Dr. C. A. Barber will read a paper on Sugarcane, and several other interesting subjects are on the programme.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Shevaroy Planters' Association.

A Gift of Coffee to the Troops at the Front.

At a Committee Meeting held at Yercaud on 10th November, 1914, the following resolution was passed:—

"That a subscription list be circulated to all Members of the Associa-
" tion and other Planters—asking them if they would be prepared
" to contribute coffee to the Allied Troops in France and Belgium
" limiting the amount to one Cwt. of Parchment coffee (4½ struck
" dry Bhls. of Parchment=1 Cwt.) per subscriber."

The names of those who subscribed to the above Fund are as follows:—

Rev. Father Capelle, Mrs. F. Campbell, Messrs. S. Campbell, Chas. Dickins, R. Gompertz, R. A. Gilby, Mrs. Gaitskell, Messrs. N. Hight, L. Hight, J. C. Large, E. Large, W. I. Lechler, C. G. Lechler, K. Leeming, G. Muthieal Chetty, A. G. Nicholson, F. Pegg, E. L. Poyser, C. Rahm, W. Rahm, H. S. Robinson, C. D. Ryle, E. W. Short, F. D. Short, C. K. Short, B. N. Short, G. Turner.

Total collected=121 Bhls. Parchment Coffee.

The thanks of the Association are due to Mr. Edwin Dickins for kindly taking charge of the consignment and despatching same to Messrs. Stanes & Co., also to Messrs. Stanes & Co.. and the W. C. G. Co., for undertaking to prepare the coffee ready for use—free of all charges.

(Sd.) CHAS DICKINS, *Hony. Secy., S.P.A.*

13th January, 1915.

BRAZIL, PERU, BOLIVIA.

EXPORTS OF RUBBER FROM THE AMAZON BASIN, *via* PARA.

The Acting British Consul at Para reports that the quantity of rubber exported from Para, Manaos, Iquitos, and Itacoatiara, *via* Para, during the month of September, and nine months ended September 1914, was as follows, the corresponding figures for 1913 being added for purposes of comparison:—

Month of Sept., 1913.	Fine Kilogs.	Medium Kilogs.	Coarse Kilogs.	Caucho Kilogs.	Total Kilogs.
To United States ...	620,311	173,489	326,228	181,695	1.301,723
To Europe ...	867,141	76,769	160,191	243,711	1,347,812
Total ...	1,487,452	250,258	486,419	425,406	2,649,535
1914:—					
To United States ...	564,209	97,993	318,720	205,893	1,186,815
To Europe ...	424,669	43,372	47,022	73,213	588,276
Total ...	988,878	141,365	365,742	279,106	1,775,091
Nine Months ended September, 1913.					
To United States ...	4,868,141	934,403	4,032,614	2,712,348	12,547,506
To Europe ...	8,014,992	1,162,112	1,846,091	5,760,612	16,783,807
Total ...	12,883,133	2,096,515	5,878,705	8,472,960	29,331,313
1914:—					
To United States ...	5,216,336	1,062,248	3,853,925	3,816,981	13.949,490
To Europe ...	7,295,946	911,490	1.217,541	4,304,504	13,711,481
Total ...	12,512,282	1,973,738	5,071,466	8,121,485	27,660,971

—*Board of Trade Journal.*

THE LONDON PRODUCE MARKETS.

Finance and Industry.

The moratorium came to an end without any blowing of trumpets on the one hand, and, so far, without weeping or gnashing of teeth on the other. The truth is that in this, as in other matters, by a praiseworthy system of co-operation between the Government, the banks, and the public the more serious shocks have been warded off, even if they cannot be entirely avoided. Although of course, we are as far as ever from the final settlement in many respects, there are many now who can sleep more peacefully than they have been able to do for a month or six weeks past.

An excellent return was issued by the Bank of England at the beginning of November, and the following table, which we take from the London *Times*, shows the position on November 4th, as compared with the week previous, and also a year ago:—

	Nov. 4, 1914.	Oct. 28. 1914.	Nov. 5, 1913.
Bullion ...	£69,474,113	£61,872,740	£36,772,121
Notes in circulation ...	35,580,000	35,112,670	28,739,935
Public deposits ...	16,450,904	24,993,910	7,131,899
Other deposits ...	140,293,123	126,736,526	42,396,998
Rest ...	3,193,737	3,210,364	3,189,072
Government securities ...	17,204,087	19,427,087	11,788,175
Private securities ...	104,904,925	104,868,405	29,034,901
Reserve ...	52,394,113	45,210,070	26,482,186
Proportion ...	33·4%	29·8%	53·4 %
Price of Consols ...	68½%	—	72 11/16%
Bank rate ...	5%	5%	5%
Price of bar silver ...	23*d*	—*	27⅜*d*.

New York at the same time reported that her money market has been easy throughout the week ending November 7th, and both call and time loans have been readily obtainable at 6 per cent. For renewals the rate remains at from 6 per cent. to 7 per cent., much depending on the quality of the security. Commercial paper has been in fair supply, and discount rates range from 6 per cent. to 7 per cent. for good names. Foreign exchange has been quiet, with both sterling and francs harder.

The Wool Markets continue to be well attended, and, taking those of November 5th, as a type, we have to report that the offerings embraced some very good lines of both greasy and scoured, the best of the first-named descriptions, which were found among the Sydney wools under the "Goondoobluie" mark, selling up to 1*s*. 3½*d*. per lb., and those from Queensland at 1*s*. 2½*d*., while greasy half-bred lambs from Victoria marked "K in diamond" reached 1*s*. 5*d*., and scoured super-crossbred of the "Atlas Works" brand 2*s*. 4*d*.; merino combings, 2*s*. 3½*d*.; and comeback clips, 2*s*. 3½*d*. Another good scoured clip, marked "Gibb." sold at corresponding high figures, merino combings and lambs' wool fetching 2*s*. 3½*d*.; super-crossbreds, 2*s*. 3*d*. Cape wools attracted much more attention, the best of the super snowwhite selling at 1*s*. 11½*d*, and greasy combings at 9½*d*.

There has been (reported Messrs. Zorn and Leigh-Hunt on November 11th) "a further improvement in the price of plantation rubber to 2*s*. 5*d* per lb. (smoked sheet, 2*s*. 6½*d*.), and, in spite of the war, the statistical position of the commodity is favourable to producers. This is largely due to American

consumption, recent figures showing a considerable increase in the quantities of rubber sent to the U. S. A. Russia has also been taking more than usual, so the stoppage of German imports of raw rubber has been more than compensated. A shrinkage of supplies (especially in the case of wild rubbers) has also helped the situation, with the result that stocks in the United Kingdom are 1,500 tons lower than at this time last year.

So far as the Share Market is concerned, there is a satisfactory tendency for cash dealings to expand, and quite a little stream of investment business has been noticeable during the last week or two. The supply of good-class shares is decidedly restricted, and, owing to this cause, transactions are rather difficult to effect, in spite of the fact that all transactions are still for cash only. The satisfactory reports issued by a number of companies since our circular was last issued have led to inquiry from investors, and it will be noticed that various quotations have consequently improved as compared with those appearing in our previous list.

Coming now to Produce Market news generally, we have gathered together the following particulars.—*Tropical Life.*

Packing of Plantation Rubber.

By Philip Schidrowitz, PH. D., F.C.S.

The desirability of packing plantation rubber in such a manner as to exclude contamination with wood splinters, dust, etc., has been so frequently discussed, that it is not a little remarkable that so far very little, in a practical way, has been attempted in this direction. Tea, an article which sells down to about 4*d.* per lb., is carefully packed in lead foil; plantation rubber worth, even in these times, 2*s.* per lb., is stowed, unprotected, in wooden cases.

Planters should bear in mind the fact that one of the greatest advantages of the plantation over the wild article is that it can—or should—for most purposes be used without washing in the factory. The expense involved in washing and drying rubber at the works is considerable, but quite apart from this, the washing operations undoubtedly affect quality. Experience has shown that a comparison between wild and plantation rubbers when both varieties have been factory washed does not necessarily give an accurate idea of the relative value of the two articles. Wild rubber must be washed; plantation, if *clean* and dry can, for the manufacture of most goods, be taken straight to the mixing rolls. There is no reason why *all grades, including earth and tree scrap of plantation rubber* should not be sent home absolutely clean and ready for use. As a very simple and inexpensive solution of the packing problem, I suggest that the cases should contain a loose liner of cloth, simply folded over the top. These cloths could be readily washed and returned with the empty cases or separately. The cloth should be of the type so widely used in rubber works for calendering and wrapping, etc. Well boiled, this type of cloth sheds no "fluff," and the mere fact that it is used all through the factory is sufficient evidence of its practicability in this connection. The cost of these cloth liners would be infinitesimal. I suggest to dealers that they should approach manufacturers and offer them—naturally after coming to some suitable arrangement with producers—plantation rubber packed in the manner suggested at, say, $\frac{1}{16}$th of a penny per pound over goods packed in cases in the ordinary way; or alternatively that planters should take the bull by the horns, and send home small consignments put up as indicated. I feel sure they would find it well worth their while.—*The India-Rubber Journal.*

ACCOUNTANCY.

Pays and Unpaids.

As Mr. Martin in his letter of the 11th December, published in your issue of the 9th January, emphasises the importance of each cooly receiving his pay in person and that all unpaids be recorded in an "unclaimed wages account" I am tempted to pursue this important subject further, and to offer a few suggestions.

I will first describe how *not* to pay wages. The cash required to pay wages is placed on a table and as each cooly's name is called out he comes up and receives his wages from the Manager who "pays out of the heap." This is, I think, a very dangerous method, for there is no check upon the actual disbursement of the money. It might answer sufficiently well on very small estates, but on large estates with 500 coolies to pay I would certainly not do it in this way.

A good system (it is not my own invention) is as follows:

Let a statement be given showing the cash required in the following form:—

		Rs.	A.	P.	
	Rupees	752	0	0	
½	„	150	8	0	
¼	„	150	4	0	
⅛	„	210	2	0	
1/16	„	80	1	0	
	Copper	10	6	6	
					Rs. 1,353 5 6

Have pay boards divided into squares numbered from 1—50, 51—100, 101—150 and so on. You then have one board for every 50 coolies. Each cooly's name should be numbered in the Pay Roll from 1 upwards.

The cash should then be counted and arranged in heaps on the table in the order given above. The clerk or writer then takes the Pay Roll and calls off the amounts due to each cooly beginning with No. 1. The Manager, or pay clerk, makes up the amount and places it in square No. 1 on the pay board and so on to the end.

The Manager then picks out the money from the square, counts it and hands it over to the cooly.

By this method there is a good check upon the money.

At the finish there may be a few amounts left upon the pay board. These would be the "unpaids" and they should be held up till the rightful owner applies for them.

A good system of paying wages should be in force upon every estate, that is to say, one which minimises, as far as possible, the chance of fraud.

(1) The clerk who makes up the Check Roll or Wages Sheet should have nothing to do with the actual payment of the money.

(2) Each cooly should attend personally to receive his pay.

(3) As many clerks as possible should be employed upon the preparation of the Wages Sheet.

(4) The wages should always be paid by the Manager or in his presence.

It depends, of course, upon what system the Check Roll is kept, but I daresay, planters would find it a convenience to keep an "Unpaid Wages Book" something like the following:—

Unpaids.

PAY ENDING 31ST MARCH, 1914.

			Rs.	A.	P.
No. 10	Cooly's name	.....	10	6	0
„ 47	Do.	.....	17	9	0
„ 106	Do.	.....	5	0	0
		Total...	32	15	0

This book would only be a Memorandum book and would not form part of the double entry system of book-keeping.

A Ledger account would be kept for all "unpaids" and would appear in the Balance Sheet as a liability of the Estate.

I would like to see this subject discussed and possibly what has been written may lead to it.

GUY TURNER.

Yercaud.

BRAINS IN AGRICULTURE.

The following is an extract from an old daily paper sent in to use by a correspondent as being a useful paragraph:—

BRAINS IN AGRICULTURE.

It has been too long the case that anybody was thought capable of being an agriculturist or farmer. If a young fellow was not fit for a commercial position in an office or store, he could be sent to a pen or estate to work there. Agriculture was the last resort and to the credit of our soil and climate, such a fellow at least made a living where in commerce he would only have been fit for a labourer's job. The stress of competition has now made the agriculturist's occupation the most serious and complex and important of all. He requires to know something of everything. He must be a good business man, that is, he must be able to know enough of commerce to follow the markets whether the tendency is up or down, prospects good or bad for himself, not depending upon an agent. He must be a good correspondent and know bookkeeping well. He ought to know something of veterinary science and of blacksmithy, so that his horses are well kept and in health and that that most important thing, shoeing, is done properly. A little bit of geology, of the making up of soils, a snatch of astronomy or weather science, so that he may recognise preliminary symptoms of storms, rain or dry weather, in the skies; a large lump of entomology is valuable as he has insect pests to fight continually; a good grounding in botany is exceedingly useful, so that the physiology of plants is known to him. In fact, no job requires more brains than the man who would till the soil and produce crops successfully. The more brains, and the better cultivated these brains are in our agriculture, the better for this country.—(Extract from old daily paper sent by a correspondent).—*The Journal of the Jamaica Agricultural Society.*

RUBBER

"The Rubber Outlook."

FROM THE STANDPOINT OF THE ORDINARY SHAREHOLDER.

(Contributed.)

Such was the subject assigned to me by the Editor some time in mid-July, and at the moment it seemed comparatively easy to write an article on the topic. Not that the writer can lay claim to any special or expert knowledge. He only possesses that which may be acquired by anyone who will read the trade journal, and keep his eyes and ears open for any stray bits of information which may come along. And therefore this article is not written for the expert. It only professes to record some impressions which have inevitably, though gradually, fructified as the result of such reading and observation.

But since July the war has come upon us with all the unknown and unknowable possibilities for the trade of the world which must follow its wake. With so many new factors of unascertained value brought into the problem how can one venture to write on the rubber outlook?

It seems best to give the writer's views as they existed in the days immediately preceding hostilities, reserving a little space at the close of the article for such modifications as the outbreak of war may render needful.

The outstanding feature of the plantation rubber industry is that it is a new comer among the industries of the world. Little or no experience from analogy was available to assist the early pioneers of the planting world. Small wonder then if mistakes have been made, or that "expert" opinion has so often proved fallacious. The unforeseen has again and again upset the calculations, both of friend and foe, both on the credit and debit side of the account. Take, for example, the movements of price. Who in 1904, when considerable acreages began to be planted, or in 1907, when still more extensions were made, anticipated either the collapse of the market in 1908 or its phenomenal recovery in 1910, or its even greater and more permanent movement in a downward direction in 1913? Not the extent, but the rapidity of the fall has been the surprise. In the preface to a well-known manual (edit. 1908) the opinion is hazarded that a very satisfactory profit would be realised, "even should the price of plantation rubber fall to 3*s.* per lb." Two years later people were talking confidently of double that price for a long time to come; five years later the same people would have been delighted if they could have been sure of a steady 2*s.* 6*d.* per lb. It is abundantly clear that the industry has provided many a pitfall for the unwary prophet. And it is not surprising that many of us look askance at the expressed opinions of the expert.

But we must not forget the other side. The growth in consumption has been truly remarkable, fully equal to, if it does not surpass, the anticipations of the optimist. How then are we to account for the disappointment of the present time, for such it is, and with what confidence can we look to the future?

Those of us who in days not very remote invested perhaps in too sanguine a mood, in this industry, must learn to take long and broad views of the situation, not paying too much attention to detail, but endeavouring to get to the bed-rock of the conditions which govern its progress.

One reason for such long views lies in the nature of the case. The industry is concerned with a tree, not a plant or a shrub with the life, at the utmost, of two or three years. The Hevea brasiliensis is a tree with by

nature a long life. Even now we do not know the limit of age as planted and tapped in moderation. The writer comes from a fruit county. It used to be said that a man might plant an apple orchard, but it would be his children fifty years hence who would see its zenith of production. No one should have embarked capital in plantation rubber unless he could afford to wait, if need be, for results. This may be poor comfort to those who, unable to wait, have lost heavily. But it has a measure of re-assurance for others more happily situated. Matters will right themselves if they can hold on.

The advent of more prosperous days will be hastened if the "experts" will have the courage to recognise mistakes, and to retrace, if need be, their steps. Let "experientia docet" be their motto. The writer does not wish to run a tilt against them. He only wishes to see a little more evidence of accommodation to facts.

One sheet anchor of the optimists has been the confident anticipation that plantation rubber would kill the wild rubber industry. Calculations have been based on the gradual elimination of competition from this source due to their respective costs of production. Time admittedly must be given for this factor to tell. But the more severe and rapid the fall in price the more quickly should it have had the expected effect. It was said in 1910, that at 3*s*. 6*d*. per lb. plantation rubber would shut out competition from Brazil. In the summer of 1913, Dr. Schidrowitz wrote an article, the effect of which was that, since for some time the trade could not be carried on with any supply of Brazilian rubber, a minimum price of 3*s*. per lb. for plantation might be looked for. We are much below 3*s*. per lb. now, and have been for a long time.

Is it not more reasonable to suppose that industries upon which the daily food of large populations depend will take a great deal of killing? Half a loaf is better than no bread. These people must adapt themselves to circumstances, and until another mode of obtaining a living is possible they will continue to produce rubber. Low costs in the East may eventually kill production in the West (Brazil and Africa). But the time may be far distant, and we should not frame too roseate anticipations upon its near advent. We must try to find some more certain (and, shall we say, more humane) way of securing the prosperity of our own industry.

To the writer's mind there is but one way "killing" wild rubber or, to put it more considerately, of getting the best of the competition. We must produce the better article. We must recover the premium over hard Para. There will always be a demand for the best of anything. The superior quality of any article will always be produced if production is possible. There is a brand of paper which artists insist on having at any price. With hard Para, as with plantation, the production of the best carries with it the production of second and third qualities of the nature of by-products. And so long as these fetch a little more than the cost of carriage they will be sold to cheapen the cost of the first quality. Therefore it is certain that the best wild rubber, and with it a certain quantity of inferior, will continue to come into the market unless plantation companies can produce its equal, if not its superior.

At one time it was thought that they had achieved this end. Did not their best command a higher price than the best wild? Yes, when the production was relatively small. But as soon as it increased from 15,000 tons in 1911 to 28,000 in 1912 prices were equal (washing loss being taken into account.) When in 1913 production grew from 28,000 to 47,000 tons the balance rapidly went against plantation rubber, and this has continued ever since. Only one cause can account for this relative movement of prices.

The special uses for which plantation rubber was more suitable were fully supplied, and the surplus met with neglect in favour of hard Para.

The writer is not unmindful of other factors making for the present position. But he does not think that they invalidate his general conclusion. Thus hard Para may be specified for certain contracts, but they cannot represent the whole of the output. Manufacturers may in some cases be prejudiced in favour of old methods and familiar material. But it must be a very stubborn prejudice which for more than a year can withstand the allurement of so much cheaper a material. Methods of sale may be against plantation rubber. But if the manufacturing world as a whole considered that plantation was the equal, let alone the superior, of hard Para, the two sorts would by now have more nearly approached parity of price. The majority of manufacturers must consider that hard Para is the better quality of the two.

Quality is the question of appraisement; opinions may differ as to the quality of an article. And the buyer's estimate is the prevailing one. He may be mistaken, but so long as he believes that one sort is better than another for his purpose, he will continue to give more for it. The seller of the other sort must convince him that he is wrong. And if the seller is really right that should not be an impossible task. The seller may tempt the buyer by a lower price until the latter learns by experience which side his bread is buttered. But if that method fails, as it seems to have done in our case, he must resort to others if they exist. And if even then he does not succeed, the seller must, if possible, provide the buyer with the article in the form and of the character which he prefers. He must meet his market.

Two means seem to be within the reach of plantation companies of obtaining the premier position in the rubber world—if their article is in essence what they believe it to be. The Rubber Growers' Association has told us that there are scientific methods of ascertaining by actual tests what are the physical and chemical qualities of any given lot of rubber. Why not adopt them? What if some samples are proved thereby to be inferior to others. Is any satisfactory business ever built up in the long run on misrepresentation? If the tests proposed give the manufacturer correct information as to the behaviour of the rubber he buys what more can any honest trader want? Such information is bound to tell on the market in time, and it is passing strange to the writer that the recommendations of the R. G. A. on this point have not long ago been carried into effect; if not by the companies as a whole, at least by some of them.

Again, it is possible that the best plantation rubber is scientifically purer than hard Pará, and yet that for some large purposes the latter is preferred on practical grounds. Acid coagulation may be detrimental even when the minimum is used: better keeping qualities may attach to that coagulated by smoke and heat; manufacturers may prefer to do their own washing and rolling, and prefer to buy their rubber in the crude form than in the semi-manufactured state represented by rolled sheet and crepe. If that is so, then it is for the companies to meet the buyers, to give them what they want, rather than tell them what they ought to have. The Wickham process seems to have great possibilities, because it approaches so closely to the Brazilian methods. There is probably room for improvement in it, and ways of economizing smoke can surely be found. But it, or some very similar method, ought to be tried, even though the trial is a confession that in the treatment of the latex the industry has been on the wrong tack all these years. But is that surprising in a new industry?

It seems probable to the writer that the uses of rubber are now so numerous that various forms of rubber have each their special advantages, and that probably no one form of preparing it should be exclusively adopted. A proper system of evaluation, a readiness to produce any variety of rubber for which there is a demand, more attention to the segregation of the latex of the older and younger trees, improved systems of tapping, should enable the companies to meet the competition of hard Para and other wild sorts with more satisfactory results to the shareholders.

Now that planting is for some years to come probably at a standstill, time and energy can be devoted to the best way of preparing the product for the market.

Concerted action in the sale room would greatly assist in securing better prices for our product. No doubt it is difficult to bring about owing to the diversity of interests in the various companies. The older companies may not feel the pinch of low prices so much as the younger, nor those in one part of the East so much as those in another. One can spmpathise with the companies who have seen their market spoilt by the inrush of new concerns. They have been disappointed and their expected phenomenal profits have been knocked on the head. But this was sure to happen sooner or later, and just as it seems doubtful whether wild rubber will soon go under, so it is doubtful if the younger estates will be able to produce. For the prospects of the industry are on the whole still sufficiently encouraging to warrant the investment of capital. Capital will be found to take over derelict concerns at a price, and though the companies may come to grief, it does not follow that production will much diminish. Any movement which tended for a time to keep rubber at about 2*s*. 6*d*. per lb., or at all events which obviated the disadvantage of many sellers vieing with each other for the favours of a few buyers, would benefit the older companies. Few, if any, are quite free from capital requirements. Should rubber drop to 1*s*. 6*d*. per lb. it will not be as easy for them to raise all that they still need, as it has been in the past. Instead of premiums of £4 for £1 share in new issues nearly at par. Thus they are severely handicapping their future.

The future largely depends on the degree to which new uses will absorb the increased production. To what extent are the confident anticipations of the past likely to be realised? In making his investments the writer was influenced by the potentialities which appeared to be before the motor industry, not only on its pleasure side, but on the industrial also. He thought that the latter would prove to be the bigger thing of the two, and a market in which the scope for development was almost unlimited. Events seem to be justifying his anticipations, and a cheaper fuel, which must come in time, will tend to accelerate the use of mechanical transport. Motoring is not so much a luxury as a necessity. Small tradespeople will have their motor delivery vans as well as the large stores. But when he looks at the probable great increase in production of plantation rubber he would feel happier if he could see some new industrial use coming forward likely to consume large quantities. The basis of the demand needs broadening. The recent Exhibition was somewhat disappointing in this respect. The rubber street paving shown was costly, there were some doubts as to its practicability, and hints have been given as to its safety. But there is this to be considered, that as a product in large quantities rubber is a new comer. No manufacturer would think of putting an article on the market at an attractive price unless sufficient quantities of raw material were in sight at a reasonable figure. Otherwise a great demand would absorb supplies, and send up the price. The demand for existing uses of rubber has hitherto abou

balanced the supply. But the position is now altered, and a new use would have to be an exceedingly big consumer to put up the price above 3*s*. per lb., or even 2*s*. 6*d*. There is therefore much scope for inventive ingenuity and it will no doubt be stimulated.

This consideration leads straight to another, and that is the large amount of capital which is involved in this new industry. It is probable that the want of financial facilities have had a good deal to do with the collapse in prices. Larger stocks of the raw material have had to be handled, increased buildings and machinery provided, and any new use would add to capital requirements. Have the companies been sufficiently alive to the necessity of helping to provide this capital by accumulating large liquid reserve? They have been concerned with their planting programmes, and how to carry them out as expeditiously and economically (in respect of capital outlay) as possible. And so they have relied perhaps unduly on one great asset of the industry. Unlike many other phases of the agricultural industry, rubber plantations give a daily return. There is a constant stream of money flowing in from sales of produce to meet current expenditure. This is a great point in favour of its ultimate prosperity. But the advantage which it gives must not be utilised only in one direction. It ought not to be used solely to provide for current expenditure. Some portion of it should go to assist the broker in making his bargains. The farmer who must sell his produce directly the harvest is over is not in a good position for fixing a price. He is largely in the hands of the buyers. In the past when there were more buyers of rubber than sellers a financial policy was possible which to-day is out of the question. Companies must husband their resources, even though they have to reduce dividends or postpone the era of dividend paying for a year or two.

The writer then, though he confesses on the whole to grave disappointment, is not unhopeful of the future. He is doubtful if the large fortunes which have been made in the past will recur, but he thinks that the fundamental conditions of the industry are sound, and that a very reasonable return may be looked for on capital expended. That is distinct from capital invested. The anticipations of the boom are not likely to be realised. The only way to recover loss on that account is to buy, if possible, shares of the younger and sounder companies. The disappointment has been so severe that extensions of any size are probably checked for years, and the probabilities are that consumption, in the inevitable growth of human needs, will in a few years make such a price possible that what are now young companies (being then old and in full production) will repay to present investors some of the losses which they have incurred on purchases in the days immediately following the boom.

Such was the writer's general conclusions before the outbreak of war. It remains to consider how far they should be modified by more recent events. Whatever opinion is offered must be of the most tentative kind. The immediate result of the war has been an immense demand for tyres and india-rubber goods by the Governments. The era of motor transport is much accelerated, and the loss of horses in the war will tend to promote the use of motor vehicles by various classes in the future. On the other hand, the immense expenditure of unproductive capital must affect the spending power of the world for a generation. It will check excursions in costly experiments. These detrimental influences will only be modified if one result of this colossal war is a restriction of armaments, voluntary or by treaty. This would at once readjust the balance and the countries concerned may then recover themselves with unexpected ease.—*The India-Rubber Journal.*

CORRESPONDENCE.

Adderley Estates,
Coonoor, 5th January, 1915.

Spraying for Green Bug.

To The Editor,
The Planters' Chronicle.

Dear Sir,—In the article on "Spray for Green Bug" in your issue of 2nd instant, the quantity of water used with the fish oil soap rosin and washing soda experiment is not mentioned. If it was 4 gallons of water the mixture would be the most economical of any that have been mentioned as yet. I have been using English soft soap in place of Blue Bar for the past six months and have found it much more effective and economical.

This combination for brushing I have been using for some time and have found it takes effect in about half a day :—

English soft soap	10 oz.	Rosin	6 oz.
Soda Ash	2½ ,,	Refined saltpetre	1½ ,,

to 4 gallons water. It saves trouble to boil enough for 16 gallons in one 4 gallons tin and add the water to make up the 4 tins mixture afterwards, and this cools the lot ready for immediate use.

The approximate cost of 4 gallons of above is 2 annas 11 pies compared with about 4 annas 6 pies for the same quantity of the fish oil rosin soda soap mentioned in your article. For spraying, soda ash should be increased to 4 oz. and saltpetre omitted. Care should be taken that the rosin be powdered and mixed with soda ash first and then dissolved the other ingredients to be added after rosin has dissolved. I should be glad if some one would experiment with this mixture and report their results, as the saving in cost of mixture is considerable. I shall procure 1 cwt. of the fish oil rosin soda soap and try it on alternate lines of coffee with the mixture I am using.

I am, dear Sir,—Yours faithfully,
L. A. Gerrard Rogers.

Increased British Taxes.

The Editor,
Planters' Chronicle.

Sir,—By the Finance Act 1914, (Session 2) British Income Tax has been increased by one-third for 1914-15 and for 1915-16 the rate is to be doubled. All persons having income subjected to British Income Tax will have to suffer this increased rate. In many cases, however, a considerable rebate from the full rate can be obtained, as irrespective of the total, certain classes of income are entirely exempted from the tax, and in the case of a person who is or has been in the service of the Crown, or is in the employ of a Missionary Society, or is resident abroad for the purpose of health, a rebate is allowed when the total income does not exceed £700. If advantage can be, and is, taken of the Exemption or Abatement, the virtual rate of tax is considerably reduced, and is in many cases quite nominal. Relief can only be obtained by claiming repayment of the tax deducted, and as there is a time limit within which claims can be made, the matter is one calling for immediate attention. At the present time a claim for repayment for four years can be made, but after the 5th April next claims for three years only will be admitted.

Yours faithfully,
For the Tax Adjustment Agency,
E. Montague,

386, Oxford Street, London, England, December 1914.

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs. is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry* should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials.

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India.
BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 4.] JANUARY 23, 1915. [PRICE As. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Scientific Department publishes a note on where Fish Oil Resin Soda Soap can be procured, and an analysis of a sample of slaked lime.

A Review of the markets is given compiled from *Tropical Life*. The significance of the increased export of tea from Holland to Germany is most noticeable.

From the *Board of Trade Journal* we extract a note on the commercial conditions in Brazil and its changing business methods.

Some interesting information on the Antwerp Rubber market before the War is taken from the *India Rubber World*.

An article from the *India Rubber World* is reproduced describing the Belgian Congo as a Rubber producing country. The Congo which was first called The Congo Free State, with Leopold II as Sovereign, passed in 1908 from under Leopold's rule to the control of the Belgian Parliament. But like nearly all industries it has been affected by the War, and should eastern properties be able to bring their rubber to the market at a shilling a pound, the competition will severely affect the planters of the Congo.

A very interesting article on the Colour Industry and its position in England is given by Doctor Molly Perkin whose father founded the Coal Tar Industry. One cannot help noticing the activity of the German Chemists and their discoveries, brought about by their scientific application and their monopoly by Germany. The discoveries have been marvellous and one cannot help repeating the hackneyed phrase "Peace has its victories no less renowed than War", and it cannot be doubted that however war must be at some times absolutely necessary, their effects are much more lasting and beneficial to the world though not surrounded or attended with all the pomp and circumstance of war.

The supply of chemicals to Britain and her dependencies is taken from *Nature* and here again we are dependent on Germany for the supply of an every day necessity.

We give some extracts from *Capital* and publish an article on Iodine which may be found useful.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Spray for Green Bug on Coffee.

With reference to the note on this subject published in the *Chronicle* of 2nd January, I have received several enquiries as to where Fish Oil Rosin Soda Soap may be obtained. Application for it should be made to Mr. A. K. Menon the Oil Chemist, Madras Fisheries Department, Tanur.

Slaked Lime.

A sample of Slaked lime sent to the laboratory for examination gave the following analysis :—

Calcium hydrate	...	42·71
Calcium Carbonate	...	14·85
Magnesia	...	5·28
Silica	...	21·51
Stones and Refuse	...	11·20

This is a lime of poor quality. It contains a large quantity of silica, stones, and useless material, which not only lowers its fertilising properties but makes the cost of transport high.

A fresh well burned sample of lime which has been carefully water slaked contains little or no calcium carbonate. The presence of 15% of this in the above sample shows either that it was not well burned, or that it has been allowed to air slack.

The Magnesia content is also on the high side and this substance is deleterious to plants. In a recent Memoir by Dr. Leather and Mr. NathSen, it is shown that, "if a mixture of calcium and magnesium carbonates is subjected to the action of carbonic acid and water, the calcium carbonate is largely or wholly prevented from dissolving. If magnesium carbonate is added in any material quantity to agricultural land it may readily cause an almost entire precipitation of calcium carbonate and hence render the soil unfertile."

Review of the Markets.

I am indebted to *Tropical Life* for the following notes which have been compiled from the Market reports in that paper.

Rubber.—A good demand prevailed during the month of December, 1914, despite the prohibition of shipping, and sales of good extent were made. Supplies available were limited, and Rubber was still coming to hand slowly at the end of the month owing to congestion in the Port of London, due to the considerable difficulties experienced in handling fresh arrivals, and to the shortage of skilled labour.

The import of Rubber into England from January to November, 1914, was 37,749 tons, of which 37,296 tons were delivered. The stock at the end of November was 3,581 tons. This is an increase in the amount of rubber imported of 8,547 tons over the same period in 1913.

Spot prices during the month were :—

Standard No. 1 Crepe	...	2 2½—2 2
Ribbed Smoked Sheet	...	2 5¼—2 4½
Hard Fine Pará	...	2 9 —2 8½

Coffee.—No new crop from India has yet arrived in London. The world's visible supply on 30 November, 1914 was 597,395 tons, a great deal

less than on the same date the year before or in 1912. This is accounted for by the falling off of receipts of Coffee at Brazillian ports of nearly $3\frac{1}{2}$ million bags as compared with last year. Prospects of good prices for the Indian crop seem bright.

Tea.—The average for the whole sale for Garden Account at the beginning of December was 9*d*. per lb, for Indian kinds.

During September and October 1914, 16,328,464 lbs. of tea were sent from Holland to Germany as compared with 1.058,356 lbs. during the same period in 1913, a fact which is ample justification for the stringent measures being taken by the Board of Trade and the Amiralty.

RUDOLPH D. ANSTEAD,
Planting Expert.

COMMERCIAL CONDITIONS IN BRAZIL.

Changing Business Methods.

The following information has been received from a reliable source:

Up to the end of 1912 the increasing prosperity in the foreign trade of Brazil gave little indication of the general decline that was to follow in 1913. Rubber and coffee, upon which Brazil mainly depends for the meeting of her foreign obligations, contributed 84 per cent. of the total value of exports in 1912. The increase in the value of coffee exports was almost entirely due to the high prices ruling. Rubber prices fell considerably, but there was a large increase in the amount exported. The balance in favour of exports *plus* capital imported from abroad enabled the country to meet punctually its foreign obligations, while the large importation of gold was taken as a further sign of prosperity.

This prosperity was suddenly arrested through the stringency in foreign money markets which followed the outbreak of the Balkan war. Brazil had for so long grown accustomed to the unchecked inflow of foreign capital that her economic development suffered an immediate set-back directly such assistance was withheld. During the five years 1908-12 Brazil had only to ask for money to get it. Much of the capital borrowed was no doubt fruitfully employed, but much of it was expended in unproductive undertakings. The easy acquisition of capital led both the Government and private individuals to be extravagant from over-confidence. The withdrawal of capital was followed by a decline in the prices of the chief Brazilian products—rubber and coffee. The Government there unable to meet obligations they had incurred upon railways, quite apart from the indebtedness they were under to many enterprises of doubtful value. Many businesses founded upon apparently prosperous conditions, when passed by their creditors, had to go into liquidation. It was the combination of all these causes which led to the present crisis. The serious character of the present situation has convinced the Brazilian authorities of the necessity of minimising its effects by practising strict economy in the various branches of the administration, but while the Treasury aided by the Bank of Brazil, is setting an excellent example in this respect, there is still an inclination to embark upon the undertakings which might well be left over to more prosperous times. However much individual Ministers may try to cut down expenditure, the finances of the country can never be kept under proper control so long as Congress has the power to vote huge sums outside the Budget in a series of special credits.—*The Board of Trade Journal.*

RUBBER TRADE.

The Antwerp Rubber Market.

In the course of an article on Belgium and its Rubber Trade in *The India Rubber World*, some interesting particulars are given about Antwerp and the crude Rubber market there before the War.

It was intended by the Belgium authorities to make at Antwerp the largest harbour in the world and up to 1909 about nine and a quarter millions sterling had been spent on this project with the expectation of spending ten millions more and the hope of finishing the work in 1920. The annual imports of Rubber into this port for the last 21 years are seen in the following table :—

THE IMPORTS OF CRUDE RUBBER AT ANTWERP FROM 1893 to 1913.

	tons.		tons.		tons.
1893	724	1900	5,698	1907	5,054
1894	1,393	1901	5,849	1908	5,035
1895	1,406	1902	5,403	1909	4,685
1896	1,115	1903	5,726	1910	4,058
1897	1,679	1904	5,763	1911	4,335
1898	2,014	1905	5,713	1912	4,777
1899	3,402	1906	5,772	1913	7,703

Ten to fifteen years ago nearly all the rubber imported into Antwerp came from the Congo Free State. For instance, of the total of 1901—5,849 tons—5,417 tons was Congo Rubber and only 432 tons came from other sources. During the last few years, however, Antwerp has received increasing quantities of rubber from the Belgian plantations in the East. The following table shows all the sources of Belgian rubber importations for the last three years :—

IMPORTS OF CRUDE RUBBER INTO BELGIUM FOR 1911-1913 AND THE CHIEF SOURCES OF SUPPLY.

From	1911 tons.	1912 tons.	1913 tons.
Belgian Congo	4,020	4,530	3,590
Ceylon		1,080	2,388
Straits Settlements	837	495	505
British India		47	87
United States	529	523	318
France	1,326	1,171	949
Great Britain	1,550	2,001	3,035
Netherlands	735	1,119	1,361
Other Countries	2,168	2,704	2,512
Total	11,185	13,670	14,745

A comparatively small percentage, ranging from 20 to 25, of the Belgian rubber imports represent Belgian consumption, the remainder being distributed to various points.

It will be seen from the table above that Belgian rubber imports from the East have increased rapidly during the last three years. In 1913 they amounted to 2,980 tons as compared with 837 tons two years earlier. The greater part of this rubber came from the estates established by Belgium in Malaya, Java, and Sumatra.

RUBBER.

The Belgian Congo as a Rubber Producing Country.

The following account of Rubber production in the Belgian Congo is extracted from *The India-Rubber World* :—

The first authentic information on the Congo country was given to the world in 1869 by the great missionary explorer, David Livingstone. The Upper Congo was explored by his successor, Henry M. Stanley, who organised there the International African Association, its promoter being King Leopold of Belgium. Stanley first told the world of the great material resources in ivory, rubber and other products of the Congo. The first exports from that section were confined to ivory and rubber, as the cost of transportation made it impracticable to bring any of the other products of that vast territory to the markets of the world. The shipments of rubber from the Congo began in 1887, when 33 tons were exported. The volume of exports increased rapidly, reaching 136 tons in 1890, over 600 tons in 1895, and reaching their maximum, 6,614 tons, in 1901. This rubber was largely extracted from the *Landolphia* vine and secured in such a way that in most instances the vine was destroyed.

The prospects for profitable operation were so great that many companies were formed to extract the Congo rubber and to develop the country in various ways. Among the pioneers in this work was an American, Warren C. Unckles, of New York, who arrived at Boma in July, 1892, and proceeding thence up the Congo River, established Rubber camps along the tributaries of the Kassai, which flows into the Congo from the south.

The Conference of the Powers held at Berlin in 1885 constituted this territory into the Congo Free State, with Leopold II as Sovereign, and from that time for the next 23 years Leopold had autocratic powers, the Congo being governed through three secretaries general, namely, of foreign affairs, finance and interior, all appointed by the King and responsible only to him. The various companies that received concessions in the Congo were as rule compelled to give the Government either one-half of their capital stock or, which amounted to the same thing, one-half of their profits. Some of these companies enjoyed large profits for many years. The Compagnie du Kassai is said to have made a profit in the year 1905 of $1,500,000, its dividends that year being three times the face value, of its shares. One of the companies which received a very large concession—amounting in two tracts to 2,+71,000 acres—from Leopold was Amcerican Congo Co., incorporated under the laws of the State of New York in October, 1906, but soon absorbed by the Intercontinental Rubber Co., a New Jercey Corporation formed a few months later to take over these concessions.

It is safe to say that no other rubber producing country in the world has received the attention that has been directed to the Congo. For a number of years before Leopold gave up his control of the Congo Free State the whole Christian World was shocked from time to time by the stories that reached it of the atrocious treatment of the natives, who, it was stated, were compelled to gather rubber by the threat and infliction of various kinds of torture. Several books were written on this subject, *pro.* and *con.* and it was made the theme of warm debates in the House of Commons. Finally the Belgian Government appointed a Committee to investigate, which, while denying actual atrocities, admitted that much pressure was brought upon the natives to compel them to do the desired amount of work. In November, 1908, the Congo Free State passed from

under Leopold's rule to the control of the Belgian Parliament, and since that time nothing has been heard about cruelties on the Congo.

There are five large companies in Antwerp which, up to the closing of that port, were engaged in the importation of rubber.

Whether the outcome of the war will make any change in the ownership of the Congo country remains to be seen, but the future production of rubber from that section will not depend upon the flag that may fly on the banks of the Congo and Kassai, but upon the price of crude rubber in the markets of the world. Great efforts have been made during the last few years to keep the *Landolphia* vine from destruction, and since 1910 planting has been done on quite an extensive scale. The Belgian Government had planted up to 1912 three and a half million *Funtumia* trees, 250,000 *Hevea* and about 150,000 *Manihot* trees. Systematic tapping experiments have been carried on by both the Government and private interests for the last three years, and there is every reason to believe that the *Hevea* can be made to pruduce to advantage along the Congo: but if the Eastern planters finally succeed in bringing their rubber to market at a shilling a pound, the planters along the the Congo will confronted with a problem in competition that may be extremely difficult for them to solve.

Indian Tea.—The quantity offered last Monday was somewhat larger than the average for one day's sale, but owing to the strong demand the auction proceeded rapidly. There was again very little to be obtained under 8½*d.* per lb., and the demand for Tea for "price" seems greater than ever. Up to 9*d.* the enquiry is very strong, and it is evident that at present there is hardly enough common Tea to supply the requirements of the trade. Outside markets are beginning to purchase more freely, while Russia is buying normally in Calcutta as well as in London. With the increasing demand for Government supplies there seems little likelihood of easier prices at present. The next sale will most likely be held on Monday, January 4, 1915.

Ceylon Tea.—The larger supplies offered at the auctions on Tuesday met with a good demand, and all descriptions up to 9½*d.* where extremely firm. Whole leaf kinds were in strong demand, and very little could be bought under 9*d.* In broken Pekoes only a few lots of very ordinary Tea were knocked down under 9½*d.*, but above that price better value than of late was obtainable. Dusts and Fannings were unchanged. The public sales comprised 28,891 packages, nearly all of which were sold. No auction will be held next week.

China Tea.—There is no change to report in this market and prices remain firm. A small business is being done in low China about 8*d.* but the tea is poor and undesirable. Good Kintucks and Ichangs about 1*s.* to 1*s.* 1*d.* are attractive buying, but the quantity remaining in first hands is very limited.

London Tea Returns.

	Duty Paid.		Export.	
	1913. lbs.	1914. lbs.	1913. lbs.	1914. lbs.
For week ended Dec. 19....	5,121,008	5,495,723	1,350,116	947,007
For 51 weeks ended Dec. 19. ...	272,532,556	285,302,278	56,146,156	67,243,319

—*The Produce Markets Review.*

COLOUR INDUSTRY.

The Artificial Colour Industry and its Position in England.

By F. Mollow Perkin, Ph. D., F. I. C.

The coal tar industry was founded by my father, but in the early stages of the work he received much encouragement from Messrs. Pullar, of Perth, particularly from the late Sir Robert Pullar, the father of the President of the Society. It is doubtful whether, without that encouragement, he would have commenced to manufacture the product he had discovered.

I will in the first place give a brief historical outline of the commencement of the industry, then reasons why it ultimately in a large measure passed to the Germans, and finally how it may be possible in part at any rate to resuscitate the industry. The views given are my own opinions, but I give them for what they are worth.

In the Easter vacation of 1856 my father, who was at that time just 18 years of age, having been born on 12th March, 1838, found that when aniline sulphate was acted upon by potassium bichromate, a black precipitate was obtained, and on examination the substance was found to be "Aniline Purple or Mauve." This particular work was carried out in a rough laboratory, which he had fitted up in his father's house, know as "King David's Fort," at Shadwell, in East London.

As a matter of fact, the actual discovery of the dye was an accident. The aim which my father had in view was the synthesis of quinine. With our present knowledge we know that it would not be possible to synthesise quinine simply by the oxidation or aniline, but in those days when organic chemistry was in its infancy, the assumption appeared quite probable. In 1856 it seems quite legitimate to assume that a natural product might be synthesised if the elements composing it could be brought together in the right proportions.

Now, although the actual discovery of the dye was an accident, it required a mind of particular aptitude to work up a dirty black substance, to extract the dye, and afterwards to carry out the laborious work which was necessary to prove that it was a dye and could be used in place of dyes obtained from natural products. I wish to lay stress on this, because the average person—the "man in the street"—is apt to think that the discovery of a substance is the main point. It is really not the discovery of a new substance which is the chief thing, for thousands of substances have been discovered which have been put on one side as useless until the inventive mind came along and opened out new branches of industry.

My father, having discovered this unprepossessing black material, instead of throwing it way, experimented and found that a brilliant colouring matter could be produced from it which has the properties of a dye, and also resisted the action of light remarkably well. Samples of silk and cotton were dyed with it and sent to Messrs. Pullar, of Perth, who, after examining them, wrote on 12th June, 1856:—

"If your discovery does not make the goods too expensive, it is decidedly one of the most valuable that has come out for a long time. This colour is one that is wanted in all classes of goods and could not be obtained fast on silks, and only at great expense on cotton yarns.....and does not stand the tests that yours does, and fades by exposure to air."

After further experiments, a patent was taken out (No. 1984, 1856) and it was decided to commence manufacturing. In June, 1857, the building of the works was begun. In December, of the same year, the technical difficulties of manufacturing nitrobenzene from benzene having been overcome also, the manufacturing of aniline on a large scale from nitrobenzene,

and finally the oxidation and preparation of the dye, Aniline Purple, or Tyrian Purple as it was then called, was put on the market and used for silk dyeing in the dyehouse of Mr. Thos. Keith, of Bethnal Green.

In introducing a new colour, an enormous amount of experimental work had to be carried out. Mordants for use in cotton printing had to be devised. Many experiments were necessary before satisfactory results were obtained in dyeing wools and silks with this new dye. It was, in fact, all pioneering work from purifying the raw material, devising new plant, and finally applying the new product.

In connection with the raw product—benzol—it is interesting to note that it was manufactured only in small quantities in 1856, and that the price was 5*s*. per gallon for a comparatively crude product, which had to be distilled before it could be used. The coal tar itself was a drug on the market, and a great nuisance to the gas manufacturer. With the advent of the aniline dyes, and the consequent call for more and more of the products contained in the tar, the conditions changed and by degrees tar distilling plants were erected, and became a source of profit to the gas manufacturer.

The introduction of a new colour from a novel source naturally attracted a great deal of attention, and as a consequence many workers came into the field and a large amount of research work was carried out with aniline and allied products, and the number of synthetic dyes gradually increased. The second aniline dye, Magenta or Fuchsine, was discovered in France by Verguin, in 1859, who produced it by heating commercial aniline with tin tetrachloride. In these early days quite a number of British patents were taken out although, of course, a great deal of work was being carried on on the Continent. It must also not be forgotten that a large amount of pioneering work was instituted under the direction of the German chemist Professor Hofmann at the Royal College of Chemistry, London. In fact, the influence of Hofmann was of enormous value, as he imbued his students with a love of research, and taught them the importance of thoroughness in their work. The Germans, recognising Hofmann's great gifts, ultimately induced him to return to his native land as a Professor at Berlin University.

In the early days of the aniline dye industry, probably owing mainly to the influence of Hofmann, there were many German chemists in English works, a number of whom returned to Germany and have most materially helped the German colour industry.

Although the works at Greenford Green in Middlesex were the first coal tar colour works, quite a number of other works sprang up within a few years. Some of these no longer exist, but others are still with us and are of considerable size, employing a large number of hands.

A short time after the Greenford Works had been founded, Messrs. Simpson, Maule and Nicholson, commenced to manufacture dyes. Edward Chambers Nicholson, one of the partners and a student of Hofmann's, being a chemist of high attainments. Simpson, Maule and Nicholson were originally manufacturers of fine chemicals. When Mauve was produced, they took up the manufacture of of nitrobenzene and then aniline, and gradually developed into manufacturers of dyes, being the first, I believe, to manufacture Rosaniline in this country, and producing it in a high state of purity.

Messrs. Roberts, Dale and Co., began working before 1860. Levinstein's commenced in a small way in 1864. Read Holloday and Co., Williams Bros., and Dan Dawson all commenced about 1865. From the first all these firms employed highly trained chemists who, by their research

work, did much to place the industry on a strong basis. Many of the chemists, however, were Germans who as already mentioned, ultimately returned to the land of their birth and, for reasons which will be mentioned later, it was not possible to replace them by men of equal calibre. The names of a few of these German chemists who did so much valuable work in England, may be mentioned—Dr. Caro, who ultimately became chief chemist to the Badische Anilin and Soda Fabrik, Dr. Martius, who was later appointed chief chemist to the Berlin Actiengesellschaft, Peter Griess, the discoverer of the diazo reaction (chemist to Allsopp's Brewery at Burton-on-Trent), and Dr. Otto N. Witt, who became Professor of Chemistry at the Charlottenburg Technische Hochschule.

Up to 1875 the British industry was in a flourishing condition, and fairly held its own against foreign competition; and a very large number of important patents were taken out in this country. For example, Dr. David Price, in 1859, patented Violine, Purpurine, and Roseine, which he obtained by oxidation of aniline with lead peroxide. Medlock took out a patent in 1860 for Magenta. In the same year, Greville Williams discovered Quinoline Blue, afterwards known as Cyanin. Patents for Violets were taken out in 1860 by Dale and Caro, and by Smith and Coleman. In 1862 Perkin patented another series of Violets, and in 1863 Hofmann discovered a Violet known as Hofmann's Violet, which was manufactured by Simpson, Maule and Nicholson. Aniline Black, probably the fastest of all blacks, was discovered by Lightfoot in 1863. It is unnecessary to further enumerate.

A very great stride in organic synthesis was made in 1867 by the German chemists Graebe and Liebermann, who showed that the vegetable dye, Alizarin, could be prepared by fusing dibromoanthraquinone with caustic potash. They patented this process, but it was far too expensive to be of commercial importance.

My father when with Hofmann, having had special experience of anthracene, and having kept considerable quantities from the time when he was a student, was naturally much interested that anthraquinone, which is obtained from anthracene, could be converted into Alizarin. He therefore studied the matter further, and found that Alizarin could be produced by sulphonating anthraquinone with fuming sulphuric acid and then fusing with caustic soda. On treating the melt obtained by one or other of these methods with acid, a yellow precipitate was obtained, which dyed Madder mordants with the greatest ease.

All the Alizarin used had, up to this time (1869), been produced from the root of the Madder plant. This then was the first synthesis of a natural or vegetable colouring matter.

At the same time that experiments were being carried out in England, the German chemists, Caro, Graebe, and Liebermann, were also investigating the subject, and discovered the sulphonation process about the same time as Perkin. Although the patents were filed within a day of each other, artificial or synthetic Alizarin was first manufactured in this country, and until 1874 the Germans sent very little into the United Kingdom.

In 1868 the amount of Madder root produced was estimated 70,000 tons a year, but in a few years the artificial product almost completely replaced the natural colour, and Madder ceased to be grown. The total output of Alizarin from the Madder root was about 750 tons in 1868, but in 1912 the output of the synthetic product had risen to about 2,000 tons, four-fifths of which was manufactured in Germany.—Society of Dyers and Colourists, December, 1914.—*Indian Planters' Gazette.*

(To be continued.)

CHEMICALS.

The Supply of Chemicals to Britain and Her Dependencies.

After showing that the foundations of theoretical chemistry were laid almost exclusively by the chemists of England, France, and Sweden, the speaker proceeded to discuss the position of industrial chemistry. The "Report on Chemical and Pharmaceutical Products and Processes" in the International Exhibition of 1862, from the pen of A. W. Hofmann, then Professor of Chemistry in the Royal College of Chemistry and Royal School of Mines, London, contains the following passage (p. 3) :—"The contributions of the United Kingdom, and in particular the splendid chemical display in the Eastern Annexe, prove the British not only to have maintained their pre-eminence among the chemical manufacturers of the world, but to have outdone their own admitted superiority on the corresponding occasion of 1851."

Statistics in relation to the development of the alkali trade show how rapidly the production of what are called "heavy chemicals" was proceeding at this period. Figures derived from returns collected by Mr. Christian Allhusen from 81 per cent. of the manufacturers in the United Kingdom, immediately after the first Great Exhibition, are shown below. These may be compared with statistics prepared by Mr. W. Gossage for the year 1861 immediately before the Exhibition of 1862 :—

	1852.	1861.
	Tons.	Tons.
Soda ash ...	71,193	156,000
Soda crystals ...	61,044	104,000
Bicarbonate ...	5,762	13,000
Bleaching powder ...	13,100	20,000

The value of these products for 1852 was estimated at about 1¼ million pounds, while the value of the products of 1861 was calculated by Mr. Gossage at upwards of two millions sterling.

The *Board of Trade* has recently issued a bulletin concerning German competition in the United Kingdom market, and on p. 2 we find the statement that the soda compounds, excluding chromates and bleaching powder, produced in the United Kingdom in the year 1907, are valued at £3,390,000. The imports from Germany in 1912 are valued at only £8,700. As to bleaching materials, the product of the United Kingdom for 1907 is estimated at £527,000, while the import from Germany for 1912 was £44,600.

From these figures the easy deduction is made that "the imports of these chemicals into the United Kingdom from Germany are relatively insignificant when compared with the output of the same articles in this country. It is clear that in these particular lines British manufacturers have no need to fear German competition in the home market."

Similar remarks apply to aluminous compounds, coal tar products not dyes, the cyanides, sulhpuric acid, and other acids for which the bulletin may be consulted. It thus appears that the British manufacturers of sulphuric acid and soda, from the early times of a century ago, have been able, up to the present, to hold their own against foreign competition, and have thus added substantially to the revenues and well-being of their country.

Now leaving to the department of "heavy chemicals" all such things as agricultural and horticultural washes, coarse disinfectants, and artificial manures, the question arises, How do we in England stand in regard to the supply of drugs, dyes, photographic chemicals, agents for research, and perfumes at a time when many of these things are very urgently needed?

It may be safely asserted that the sources of supply of all these materials in the United Kingdom are seriously indequate. And, further, we may point to the acknowledged fact that many of the dyes, nearly all the synthetic drugs, and photographic materials have been systematically imported from Germany.

The annual statement of the *Board of Trade* shows that in 1913 we imported from Germany :—

		£.
Alizarin and anthracene dyes	...	271,119
Aniline and naphthalene dyes	...	1,382,478
Synthetic indigo	...	76.681
Total	...	£1.730,278

Under the head of "Drugs, unenumerated, including Medicinal Preparations" out of a total of imports from foreign countries and from British possessions amounting to £1,302,860, more than one-fourth or to the value of £332,464, was in 1913 received from Germany. From this is to be deducted the inconsiderable amount of dyes and other chemicals from coal-tar, valued at £24,691, exported in 1913 to Germany. According to the Final Report on the First Census of Production of the United Kingdom for 1907 this country made 139,000 cwt. of coal-tar dyes, valued at £373,000, of which practically the whole was consumed at home.

As to fine chemicals for analysis and for research, three are no figures available. but it may safely be said that there has been no appreciable production of these things in this country.

If we are ever to be in a position to supply ourselves and our Dependencies with the dyes, the drugs, and the rest of the fine chemicals repuired in our work, it will only be achieved after a careful review of the circumstances which led to the removal of the industries from this the country in which many of them originated, together with a determination to take to heart the lessons of the past.

After a review of these circumstances in which it is shown that it has not been due to inactivity on the part of scientific chemists, but to ignorance and neglect of British manufacturers down to quite recent times, the author considered what ought to be done and what it is possible to do in this country to remove reproach from British chemical industry, and to render the Empire independent of supplies from foreign sources.

We need many first-rate chemists, a few engineers, plenty of capital, and some good men of business. A combination of these elements in due proportion is certain of success, and the time, though so unhappy for the world, is favourable for this enterprise.

Inasmuch as the functions of each and the best way of combining them have already been settled in practice on the Continent, is to be hoped that the ancient precept about being taught by the enemy—*fas est et ab hoste doceri*—will not be forgotten. For there can be no doubt that the principle acted on in all German chemical factories, namely, the employment of the

best available scientific skill and the constant appeal to scientific research, has been the secret of their success.

In conclusion, two remarks only require to be made. The establishment of what will be practically a new industry in this country will require consideration and assistance from the State, if it is to survive the period of fierce competition which will follow the conclusion of the war. Encouragement is already promised to the dye industry, in the form of definite financial aid to be given by Government. But remembering that the colour-maker is dependent on the production of many chemicals, which represent intermediate stages in the processes which lead from the raw materials to the finished product, and that the production of these chemicals is naturally associated with other chemical manufactures, it is to be hoped that the temporary protection will be extended beyond the immediate field of the colour-maker.

The other remark may raise a smile on the part of those business men who are moved only by commercial considerations. There will be a great temptation when the war is over to resume former business relations with the enemy. The German chemical manufacturers have a powerful organisation and many years of experience behind them. Let them keep any markets they can retain outside the British Empire, but every man who cares for his country will surely demand that business at home shall be limited to British goods.—*Nature.*

Rubber Shipment from the East.

Supplementing the information which we have given from time to time respecting the restriction and later the prohibtion, upon exports of raw rubber from Ceylon and the Straits Settlements to places outside the British Empire, we have now received from the Rubber Growers' Association a circular clearing up some points that were in doubt. The Rubber Growers' Association asked the Colonial Office whether the term "British Ports", in the recent prohibtion included ports in Australia, Canada, and other British Colonies and Dependencies; also whether, in view of the fact that Japan is one of the allied countries, sanction could be given for direct shipments to be made from Ceylon and the Straits Settlements to Japan. The Under Secretary of State replied under date the 21st inst., that it was intended that the exception in favour of the British ports from the prohibition of the exportation of rubber from Ceylon and the Straits Settlements should apply to all ports in Australia, Canada, and other British Possessions. He added that this had been made clear to the Governors of Ceylon and the Straits Settlements and that all British oversea governments had been asked similarly to prohibit the exportation of rubber except to British ports. As regards the exportation of rubber from Ceylon and the Straits Settlements to Japan, the Secretary of State is prepared to entertain applications from manufacturing firms in that country for permission to export rubber from Colombo and Singapore for use in their factories, and the Dunlop Rubber Co. have already been granted permission to ship to Japan for use in their mills in that country 50 tons of rubber a month in each case from Colombo and Singapore. Similar applications from manufacturing firms in France will also be considered. It is also proposed to allow shipments of rubber from Colombo and Singapore to Vladivostock for use in Russia as soon as the Russian requirements have been ascertained.—*The India-Rubber Journal.*

EXTRACTS FROM "CAPITAL"

A letter from a London Correspondent shows that Mr. Lloyd George's handling of the Tea Duty has stirred up some bitter feelings. There is no desire to oppose the imposition of the eight penny tax although this means "a penn'orth of tax on a penn'orth of tea," but there is a keen desire to enter a protest against the unfairness of the Chancellor's methods. The London "Times" has not displayed much tact in its treatment of the subject. "It rests with them" (*i.e.*, the tea-drinkers) "entirely whether individually they pay it or not." That is one dictum of the London paper. "But if they do pay" your contemporary proceeds "they can obviously afford to do so, and they will have the satisfaction of knowing that their own enjoyment is for their country's benefit. This is a satisfaction that might have been granted to many citizens outside the ranks of the tea-drinkers; and those who have to pay will regard the consolation offered to them as poor indeed.

The India Tea Association and the Ceylon Association held a joint meeting to consider the enhancement of the duty. Loyalty dictated the decision that no protest should be raised against it at the moment; but it would appear that the feeling was expressed that when tea was forced to bear an additional burden cocoa and coffee were let off far too lightly. Of a large proportion of coffee-drinkers and of practically every consumer of cocoa or chocolate some of the words of the "Times" might be used with greater force than attaches to them in reference to tea-drinkers. The words alluded to are quoted above "they can obviously afford to do so."

It should be noted also that the tea consumed in the United Kingdom is to a very large extent *British Grown*. For the most part it is the produce of an entirely British Industry. The same cannot be said of either coffee or cocoa. Why should the British Industry be burdened and foreign industries not? That is a question which will have to be answered, sooner or later. The Board of Trade figures for the Calendar year 1912 show imports to have been as follows:—

	Imports.	Value.
Raw Cocoa ...	78,776,947 lbs.	£2,295,092
Manufactured ...	246,829 Cwts.	£1,869,222
Coffee ...	844,683 „	£3,004,788

As regards Home consumption the figures are:—

Raw Cocoa	60,848,404 lbs.
Manufactured	236,472 Cwts.
Coffee	260,054 Cwts.

The manufactured cocoa imported comes almost entirely from Germany, Switzerland and Holland. The rate of duty upon it varies with the amount of sugar; but the bulk of it has no sugar and pays at 2d per lb. In all probability, none of the sweetened cocoa or chocolate is included in the above figures, as it is classified under the head of "Confectionery." In fact, there is a practical certainty that every pound of the manufactured cocoa referred to above pays a duty of 2*d.* per lb. The statistics show that its average value is just under 16½*d.* per lb. Hence the duty represents an average impost of only about 12½ per cent. as against cent per cent in the case of tea.

Raw cocoa pays at 1*d.* per lb. The average value of imports works out just under 7*d.* per lb. so that the duty represents about 15 per cent. The duty on Raw coffee is 14*s.* per Cwt. The average value of

the coffee imported is slightly over 7½d. so the import duty is a little under 20 per cent. These figures are instructive and should be compared—

Duty on Tea	...	...	...	100 per cent.
,, Coffee	...	...	...	20 do.
,, Raw Cocoa	...	...	...	15 do.
,, Manufactured Cocoa		...	...	12½ do.

On no economic principle whatever can this be justified. There is no Free Trade about the matter, but there is certainly a heavier, much heavier, incidence of taxation on British Produce than on the produce (and the manufactured produce) of a number of foreign countries. For the present the protest is merely against unfairness, which will be submitted to temporarily, in a spirit of self-sacrificing loyalty. It is understood that there is no intention of restarting the machinery of the Anti-Tea-Duty League just yet; and even when peace has been concluded the necessity for continued heavy taxation during a period of years will be realised by even the sternest opponents of the high tea duty.

How many people know that there is a flourishing resin Industry in the United Provinces? Particulars given in Forest Bulletin No. 26 ("The Resin Industry in Kumaon" by E. A. Symthies, I. F. S.) show that during 1914, it was arranged to work 800,000 trees and 1,230,000 channels, and the estimated yield was 56,000 manuds of crude resin. It was only after five years of continued experiment that a distillery was erected, which turns out uniform standard of turpentine and rosin suitable for the most exacting requirements of Indian consumers, and simultaneously with this, the tapping operations are being developed as rapidly as possible. There is an excellent demand for these products and the total estimated output of the distillery has been sold to March 1915.

In 1911-12, 266,443 gallons of turpentine were imported into India and 58,600 Cwts. of Rosin. Mr. Smythies anticipates that the Bhowali distillery alone will, in three years time, be in a position to supply about 60 per cent of the total consumption of turpentine and well over 80 per cent of the rosin consumption of India. But in addition to the Bhowali Distillery, the Forest Department will shortly be erecting another distillery in Eastern Kumaon, near Tanakpur, from which an approximate annual output of 25,000 gallons of turpentine may be expected, while the Departmental operations in the Punjab will ultimately give a further 50,000 gallons, making the total output of Indian turpentine equal to 200,000 gallons per annum and of rosin to 120,000 maunds. This will absorb practically all the workable forests, of this species of pine under the Forest Department. Anticipating that a certain amount will be available for export, a trial consignment of 2,000 gallons has recently been despatched to New Zealand, with what result is not announced. Samples of rosin have also been sent in anticipation of possible export. There is no possibility of export to England or Europe, the natural outlet for any balance, after meeting Indian requirements being to Australia, New Zealand, Java, ect.—*Capital*.

M. Yves Guyot, the eminent French economist, discusses in the *Nineteenth Century* the destructive effects of the war, and its subsequent influence on the world's commerce. Even if it should last only for six months, he reckons that the loss of productive power alone will amount to £380,000,000 in German, £600,000,000 in Erance, £110,000,000 in Russia, £100,000,000 in Great Britain, and £58,000,000 in Belgium. He emphasises the fact that the price of wheat will rise with the conclusion of peace, as the result of Germany's re-admission to the world's markets.—*The Indian Planters' Gazette & Sporting News*.

TINCTURE OF IODINE.

It is not much use giving people in general here, advice on treatment of stock which involves elaborate prescriptions of little known, and not-easy-to-be-procured medicines.

In the treatment of flesh wounds, bruises and sicknesses of all kinds of live stock, horses, mules, donkeys, cattle, sheep, goats, pigs, dogs, cats, rabbits, fowls, turkeys, ducks, all of which were kept for use and profit, we evolved simple lines of treatment suitable for those who are not near towns where all kinds of medicines can be had, and who at any rate can hardly afford expensive prescriptions, or who may feel that they have not the knowledge to apply such prescriptions. Nor do we advise, if possible at all, the stocking of medicines which are also dangerous poisons; people will be careless and accidents too often happen.

One of the most useful medicines to keep in stock, one we often recommend, is Tincture of Iodine, and it can be got at any Dispensers. It is a poison, but not dangerous like Carbolic Acid or Corrosive Sublimate, and no accidents are likely to happen in keeping it or using it freely.

We publish an article on it taken from the *Farm Journal* (U. S. A.)

"Among the drugs of particular value to the veterinarian and stockman we wish to mention Iodine, in combination with alcohol, as a tincture, and with lard, vaseline or lanolin, as an ointment. The modern practitioner has come to think more and more of Iodine, in both human and animal practice.

Readers should keep it on hand for use as needed. When any poisonous insect bites a person, paint the place with Tincture of Iodine several times, and the great swelling and irritation will be prevented.

The tetanus bacillus (Lochgius) enters with the parasite or infects the wound made by scratching. It acts in the absence of oxygen, being what is known as an *anaerobic* germ. Air and oxygen kill it, and so it is best to open up a wound of any sort to which air otherwise will not gain entrance: then swab freely with Iodine.

Tetanus often kills horses that simply have collar or saddle sores. The owner daubs the parts with axle-grease or some smear, salve or ointment, thereby excluding air. Better saturate the wound with Tincture of Iodine, or with a 1—500 solution of corrosive sublimate, which is deadly to all germs and the spores of some of the worst diseases, notably anthrax.

Use Iodine freely if a boil is starting on man or beast, and particularly on what the farmer often terms a blind boil. By this he means one of those angry, sore, dark-red or purple bunches which does not readily come to a head. Such an infected centre has come from the entrance of a germ, or the bite of an insect. Flies from the carcasses of animals may cause them. They may turn into malignant pustules from the bite of an insect. They most commonly come from infection from pus, blood or other discharges getting on to the hands, when one treats a wounded or diseased animal. They are often contracted at hog-killing or cattle-butchering time—the knife or a bone scratching or cutting the hand. Saturate such wounds with Tincture of Iodine, and repeat the application once or twice daily until the wound heals and there is no sign of infection. This is home treatment; it always is best, of course, to employ the physician in serious cases of emergency or where great danger is thought to exist.

Iodine Tincture is also of great value in the treatment of all glandular swellings and in lumpy jaw (actinomycosis). Goitre on the neck of a young animal is well treated by painting the swellings with Tincture of Iodine, or rubbing them with Iodine ointment every other day. Iodine in another form—the iodide of potash—also is used in such cases being given internally in small doses for a few days.

The tincture and the iodide are sovereign remedies in wooden tongue (actinomycosis of the tongue) of cattle. The enlarged tongue is scarified lightly and ulcers are scraped. The Tincture of Iodine is applied and repeated in a few days. Iodide of potash is given internally, in one dram doses two or three times a day, for several periods of ten days to two weeks, with similar intervals without the medicine, until the disease is cured. The drug causes Iodine poisoning (iodism) when given in these large doses for the time mentioned, and the intervals without treatment are intended to allow recovery from iodism before again giving the medicine.

Similar treatment is given in lumpy jaw. The tumors and the abscesses are opened freely, swabbed with tincture daily, or packed with oakum or cotton soaked in the tincture, and the iodide of potash is given internally as in treating wooden tongue. Tincture of iodine, and the ointment of Iodine, are of great value in the reduction of all chronic swellings. Use them on puffs, such as windgalls and bog spavin, or curbs, on enlarged tendons, on forming spavins, splints and ringbones. The tincture also should be used on or in wounds that are tardy in healing, and is very useful for injection, now and then, into the fistulae of the withers and poll. It likewise is effective in the treatment of canker of the mouth, and in snout disease (bullnose or snuffles) of swine."

(In addition to the recommendations given above we use this Tincture successfully in the treatment of Poultry. For rattling in the throat otherwise Bronchitis, paint the throat outside every day. When fowls have a deep drawn wheeze, that is likely Congestion of the Lungs, and Tincture of Iodine should be painted over the Lungs. The right place can be seen by lifting the wings of the fowl, when the inflation of the lung can be seen on the bare place there. For canker in the mouth touch the white growths with the Tincture. For Bumble Foot, paint the swelling. In Yaws paint the eruptions with this Tincture. For Sore Mouth in Goats when eruptions break out all round the lips outside and inside, paint these swellings daily. —Ed.—J. J. A. S.)—*The Journal of the Jamaica Agricultural Society.*

The New Barbarism: A Prophecy.

"Continuity" writes to the Times:—

"Christianity—and this is its highest merit—has in some degree softened, but it could not destroy, that brutal German joy of battle. When once the taming talisman, the Cross, breaks in two, the savagery of the old fighters, the senseless, Berserker fury of which the northern poets sing and say so much, will gush up anew. That talisman is decayed, and the day will come when it will piteously collapse. Then the old stone gods will rise from the silent ruins, and run the dust of a thousand years from their eyes. . Thor, with his giant's hammer, will at last spring up, and shatter to bits the Gothic cathedrals."

So wrote Heine 80 years ago, and he foretold that at the head of the new barbarians would be found the disciples of Kant, of Fichte, and of Hegel who, by a regular logical and historical process, which he traces back to the beginnings of German thought, had shorn the "talisman" of its power. —*The Times Weekly.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 5.] JANUARY 30, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Scientific Department supplies us with a note extracted from Mr. Hall's address to the British Association. The efficacy of wind breaks is well-known to planters, but their usefulness as a means of stopping the evaporation of soil moisture, has probably not received such close attention. The note also includes an extract on Tea, Coffee and Rubber taken from the Consular Reports.

We continue the article on the Colour Industry and its position in England. We see by the telegram that the State is going to help it with the assistance of those who are experts in the business, who will form an advisory committee and with their support and experience England will resume her natural position as the leading export country for artificial colours which has been a monopoly practically of Germany, and which was gained from us by the far-sighted policy of that country, who liberally supported their chemists.

The Planting Expert answers Mr. Roger's letter in our issue of the 16th January, on Spraying for Green Bug and asks a pertinent question which requires an answer.

Mr. R. D. Anstead, M. A., the Planting Expert leaves Bangalore on Monday night for Kalasa District, North Mysore, where he is going to see the Coffee Drier, which has been erected by Mr. W. H. Reed, started. While in the District Mr. Anstead will take the opportunity of visiting one or two Estates where special work is going on in which he is interested. Should any planter in the Kalasa District particularly wish to see Mr. Anstead, he should address him at once.—*C/o* W. H. Reed, Esq., Mavinkere, Kalasa P. O., Kadur District.

The Director of the Labour Department offers his thanks to those subscribers who have kindly supplied him with full information concerning their labour suppliers, kanganies, maistries and coolies, amounting in number to 31,500. It is estimated that about 60,000 more are employed on subscribers estates, about whom information is not yet available.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Wind breaks as a means to stop the evaporation of Soil Moisture.

In his Presidential Address to the British Association Mr. A. D. Hall said :—

"It would be valuable to know how far evaporation from the bare soil can be checked by suitable screens or hedges that will break the sweep of the wind across the land. In England hedges have always been looked at from the point of view of shelter for stock ; we find them most developed in the grazing districts of the west, while bare open fields prevail in the east and south. Yet the enormous value of a wind screen to vegetation can be readily observed and the market gardeners both in England and the still drier districts of the South of France make great use of them."

Commenting upon this in a leading article the *Agricultural News* says, "the persistent sweep of the trade winds over the country makes the effect of wind very obvious, wind breaks, therefore, have been a matter of serious consideration in many parts of the West Indies and the extension of their use is constantly advocated. In this connection, however, it would seem that the benfit of mitigating this action of the wind upon the plants has had chief consideration, wind breaks having principally been used in connection with orchard crops like Cacao and Limes, the action of wind upon the soil itself, as affecting the evaporation from the surface, has had little consideration. It would now appear desirable to ascertain whether wind breaks may be usefully applied more extensively than at present in connection with arable cultivation as a means of reducing evaporation from soil surfaces."

The position is much the same in South India. Wind breaks are extensively used on Tea estates to break the force of the wind but no study of them has been made from the point of view of the conservation of soil moisture. One could imagine that hedges of leguminous shrubby plants planted across the Tea might be useful not only as wind breaks but as preservers of soil moisture and that they might play a most useful part in the case of young clearings, especially in districts which are apt to suffer from drought in the dry season. Mr, Hall's suggestion certainly opens up a new point of view and is worthy of study in an experimental way in the field.

Tea, Coffee, and Rubber.

The Consular Reports state that almost the entire import trade of Koweil in the Persian Gulf is with India. During 1913-14, 4,972 cwts. of Coffee were imported from India and 229 cwts. only from Brazil. In the same period 2,067 cwts. of Tea were imported from India and also 142,135 cwts. of Rice and 8,105 of Sugar.

Baghdad (Turkey) also has a considerable import trade with India, which supplies nearly three quarters of the Tea. The price obtained for Tea was 2*s*. 4*d*. to 2*s*. 8½*d*. per 'huggah,' which is 2·83 lbs.

In 1913, 1955 bags of Coffee, 7,302 cases of Tea, 18,587 bags of Rice, and 10,511 bags of Sugar were imported from India.

Angola in Portuguese West Africa, during 1913 exported 4,800 tons of Coffee. Part of this is cultivated and part is gathered by the natives from wild plants and sold to the merchants.

RUDOLPH D. ANSTEAD,

Planting Expert.

RUBBER SEED.

Hevea Braziliensis or Para Rubber Seed.

The commercial future of this bye-product depends mainly on three factors :—

1. Cost of collection.
2. Efficient seed shelling.
3. Food value of cake.

Authorities differ on the first point, cost of collection of 1 ton kernels even having been calculated to a figure of £11-13-4, which is of course a prohibitive price.

A suggestion of Mr. H. N. Ridley, F. R. S., formerly Director of the Botanic Gardens, Singapore, may point the way to the problem's solution in various tropical countries. As regards the Straits Settlements, Mr. Ridley suggested that the right of seed collection in plantations might be leased to Chinese who would utilise the labour of village children.

The Imperial Institute's trial with Millers' nut cracking machine showed that it could be successfully used for seed shelling, but trials on a large scale with various machines are recommended. It is essential that kernels for export should not be broken or crushed. Pará rubber seeds are a good example of seeds, which like castor seeds, contain the enzymic ferments previously noticed.

When the kernels are bruised, these bodies immediately begin to re-act, setting up hydrolysis of the oil, with the production of fatty acid and glycerine and resulting in the eventual loss of the latter. Thus the oil from some crushed meal sent from the Straits Settements gave the enormous figure of 65'6 per cent. of free fatty acids expressed as oleic.

Such an occurrence would ruin the product. The oil becomes valueless and the cake inedible.

Evidence so far collected is generally in favour of the possible production of a cake comparable in value to those in common use and closely resembling soy bean cake. The cake is high in percentage of proteins, carbohydrates and fat and low in crude fibre (food units 155 against soy bean cake 151).

Although the seed contains a cyanogenetic glucoside, the Imperial Institute found less than 0'01 per cent. of hydrocyanic acid in a sample of cake prepared from it ; and it should be remembered that the favourite English cattle food (linseed cake) also contains a small percentage of a cyanogenetic glucoside in the seed from which it is prepared.

Feeding experiments conducted on cows and sheep for the Imperial Institute with Pará rubber seed cake have been completely successful, the animals showing no abnormal symptoms but it is recommended that further experiments of a still more searching character should be tried in order to establish the merits of the food.

As regards the chemistry of the oil, it may be looked upon as an inferior linseed oil. In its constituents and general characters, it is very similar to this oil, but of weaker drying power, as suggested by its iodine value of 128 *cp.* tung oil 167, candle nut 164, linseed oil 170-194).

Castilloa Elastica or Central American Rubber Seeds.

Crushed seed was sent from Trinidad in 1903, but the low percentage of oil (12·5) and the presence of a bitter principle which makes the cake inedible render castilloa seeds of doubtful commercial value. The properties of Pará and Castilloa rubber seeds are compared below :—

	Para Rubber seed.	*Castilloa elastica seeds.*
Oil per cent. in whole seed	21·2	12·5
Appearance of oil ...	Clear, light yellow.	Semi-solid pale brown.
Value of oil cake ...	Probably equal to linseed cake.	Inedible, due to bitter principle.
Enzymic character ...	Flat splitting enzyme present.	Flat splitting enzyme present.
Free fatty acids per cent. (as oleic acid) in oil from good kernels ...	5·4	14·2
Free fatty acids per cent. (as oleic) in oil from crushed kernels undergoing hydrolytic action on voyage ...	65·6	50·2
Iodine value of oil ...	128	88
Saponification value of oil ...	192	197
Nature of sodium soap from oil ...	Rather soft.	Moderately hard.

Both kinds of seed contain hydrolytic ferments. The oils differ mainly in their iodine values and soap forming properties. Castilloa seed oil cannot even be classed as a semi-drying oil, but produces a harder soap than Pará rubber seed oil.—*Bulletin of the Department of Agriculture, Trinidad and Tobago.*

Germicides, Disinfectants, Antiseptics and Deodorants.

Considerable confusion exists in the popular mind regarding the meaning of the above terms. To many they signify one and the same thing, as a result of which numerous worthless preparations with a disagreeable odour, but otherwise harmless, have been employed in the destruction of disease germs without avail.

The terms germicide and disinfectant may be used synonymously to designate any agent which has the power of destroying germ life, such as sunshine, heat, carbolic acid, lysol, bleaching powder, corrosive sublimate, and formaldehyde gas. An antiseptic is something which merely prevents the further growth and development of micro-organisms without necessarily killing them; for example, alcohol, boric acid, listerine, hydrogen peroxide, and most of the common disinfectants in dilute solutions. A deodorant may be said to be anything possessing an odour more pronounced and penetrating than the odour which it is intended to modify or cover up. It does not possess, necessarily, either germicidal or antiseptic properties, and depends for its efficiency simply upon producing one odour to mask another. Many of the best germicides are also splendid deodorants, but deodorants are not generally germicides.—(Modern Farming).—*The Agricultural News.*

FORMOSAS.

December is one of the best months in the year in which to buy spot teas as, generally, there is a big supply of mature new crops in the warehouses besides the hold-overs from the previous season; and those who buy in this month have pretty much everything their way when it comes to getting bargains in quality.

When the brokers first introduced Formosas to the trade in Philadelphia, fine Foochows, Moyune greens and Congous, known as English Breakfasts, were the kinds used; therefore, to introduce a new tea in a market that was very conservative, exceptional merit had to be back of any kinds offered; and as Formosas had that merit, it was not long before they were recognised as a leading tea. The first teas of this variety shipped to the United States were high-class, well-fired, containing no Pekoe tips whatever and, when they were put in a canister, they would improve in such a marvellous manner that every time the consumer made a succeeding purchase of the same tea, he or she would find that it would drink better than the last.

There are four crops of Formosas:—The first, the Spring, which have never been much in demand, as they always drink as if they were fired before the tea was quite ready for picking; the second, the first Summer; the third, the second Summer; with the Autumn crop fourth and last.

There is something about these high grade Summer teas which charm and appeal to persons in and out of the trade; and it must be admitted that for giving man and woman a refreshing, uplifting drink, this description is far and away the pride and the most soothing of all kinds shipped to this country from the Far East. While we import every year less of the strictly choice teas, which would be good value to retail at $1 per pound and wholesale at 50c. to 60c., it is rather puzzling to account for the falling off, when our country has had unprecedented prosperity and when money is so plentiful and all want the best, even to the poorest of the working people who, as a rule, are liberal spenders.

The following, however, may throw some light on the above question: About 20 years after Formosas had been throughly introduced, certain exporters in Formosa shipped some Pekoe-tipped teas with a well-made black leaf, which sold for less money than the natural leaf teas with much superior cup, grade for grade, and those buyers, ever ready to push a new type and sacrifice cup, for style, began to purchase the Pekoe-tipped teas and work them in on their customers. This and the fact that the class of buyers referred to are insatiate in trying, every time they buy, to pay less for the same grades, results in breaking prices to the detriment of quality with a gradual loss in profits all down the line. While such buyers are bad enough, the real terrors of the trade are the shippers who will ship anything that will pass Government inspection and the importers who will import the same. These persons actually break prices on their own better grades and complain that the consumer does not want and does not buy quality.

Formosas have many different flavors and it is best to select those that have already given satisfaction rather than experiment with other of uncertain growth and liable to deteriorate rapidly; and as it is assumed by many in the trade that Pekoe-tipped, high-fired, dark liquor sorts are the best sellers and most liked, it is a question if they are as valuable, in comparison with the finest and lower grades of the medium liquor ones. In the finest medium you have a superlative character with a delicate and exquisite fragrance and cup and so full a body, when drawn, that

it makes the experienced tea man wonder how it could be so; and this singular quality is never found in the high-fired, dark liquor kinds. Another good rule to follow is to buy teas with as little Pekoe tip as possible, provided you get the cup and at a right price, as the natural or plain leaf teas in all grades have a truer Formosa character; and very frequently the low grade plain leaf are far better in the drink than those tipped, costing more money.

While the Japanese own and control the island of Formosa, it is populated by the Chinese, and this is a good place to give the Chinese planters and traders a few words of well-deserved praise for their patience, faithfulness and honesty of purpose, which are so conspicuous in their dealings with American tea buyers and others. If at any time you buy tea from a Chinaman, for future delivery, do not bother about a contract; for if he says he will deliver, you are sure of getting your tea, even though the market has advanced 10c. per pound on the grade you have ordered.—*Simons' Spice Mill.*

Tea.

Indian Tea.—Only one sale was held this week, 27,300 packages having been offered on Monday. The demand was brisk, and all descriptions were in strong request. Quality continues below the standard for the time of year. The proportion of tippy and good liquoring kinds was small, and with keen competition prices were higher. Common sorts in particular came in for increased attention, and in comparison with last week's prices now show an advance of ¼*d.* to ½*d.* per pound. Darjeelings, of which only a small proportion shows really stand-out character, have been somewhat neglected of late in public sale, but better prices have been obtained privately. For next week about 40,700 packages are in type.

Ceylon Tea.—The quantity offered at the auctions on Tuesday was considerably smaller, and, with a strong demand, all descriptions were firm to dearer. In whole-leaf kinds the lowest grades were in particular request, and were fully ¼*d.* per pound dearer, while Teas suitable for export were freely taken at an advance of ½*d.* to 1*d* per pound. Broken Pekoes generally were also higher, only a small quantity being obtainable under 8*d.*, while medium and fine descriptions frequently showed an advance of ¼*d.* to ½*d.* Dusts and Fannings were unchanged. At the public sales, 18,987 packages were offered, of which about 550 were withdrawn.

China Tea.—Stocks in London are very small, and the market during the past week has become dearer. A considerable quantity of the lower grades has been sold for shipment, and the market is now practically bare of Monings and Panyongs under 9*d.* per lb. Fine qualities have not been in great demand, and consequently buyers are at the moment in a position to secure very attractive value. Finest Kintucks are scarce and every week it becomes more difficult to follow earlier-bought parcels.

London Tea Returns.

	Duty Paid.		Export.	
	1913.	1914.	1913.	1914.
	lbs.	lbs.	lbs.	lbs.
For week ended Sept. 26..	5,175,479	4,753,983	1,125,838	2,434,845
For 39 weeks ended Sept. 26.	...203,579,928	216,865,228	40,652,713	40,061,504

—*The Produce Markets' Review.*

RUBBER.

Mr. Herbert Wright on the Position of Rubber.

In the course of some remarks at a meeting of shareholders of a rubber company Mr. Herbert Wright made the following interesting statement :—

I take it for granted that we are prepared, at a great sacrifice, to support the Government in any steps they may take with the object of extinguishing the supply of any commodity which may assist the enemy and in maintaining supplies for this country and the Allies. Without rubber the transport of men, food and apparatus would be very seriously delayed. The manufactured stocks of the enemies, known to be phenomenally large in June of this year, are now

PRACTICALLY DEPLETED.

Without further supplies of rubber the enemy will be cropped to an extent which few of us can comprehend. I want you to realise that America annually imports and consumes more rubber—about 50,000 tons—than any other country. Next comes, in order of tonnage consumed, the United Kingdom, followed by Germany, Russia, France, Austria-Hungary, Italy, and Japan, I estimate that under normal circumstances, allowing for the preference which large

UNITED STATES CONSUMERS.

naturally have for plantation rubber, that they would require for 1915 quite 30,000 tons of our product; the rest, amounting to 20,000 tons, would be Brazilian and African grades. During war they could

DO WITH A GREAT DEAL MORE PLANTATION

rubber. As you are aware, an increased tonnage compared with 1914 has been sold by plantations c.i.f. New York for delivery during 1915.

GERMANY IS OUR NEXT BIGGEST CUSTOMER.

In 1913 she received from Great Britain alone nearly 10,000 tons of rubber; in the first half of this year she received from the United Kingdom and our colonies 4,500, and also half that quantity from Brazil. A fair proportion of her imported rubber was re-exported to foreign countries. Under present conditions she can receive practically no rubber. The point which I wish to make is that hitherto Germany has been very dependent on British territory for her supplies of raw rubber, and has received very little from the United States. Similarly, with regards to Austria-Hungary, we have been the biggest suppliers of crude rubber. Russia was supplied with about 6,300 tons in 1913, and France with over 5,000 tons, from the United Kingdom alone. Japan has called for a small but still significant supply from us. Now, during the second half of this year there has been practically no supply to the enemy, but a big increase in exports to the Allies and to the United States and other neutral nations. Of the world's supplies, owing to the action of the Government,

WE DIRECTLY CONTROL THE MAIN CROP-PLANTATION.

equal to 45 per cent.; we also indirectly control that from Africa—say, 15 per cent—and may have an influence on the tropical American crop, averaging 40 per cent. of the world's supplies. Next year, owing to the increased age and acreage of bearing trees on eastern plantations and the elimination for the time being of the produce from German colonies, we may directly control 60 per cent. of the world's supply, and exert a big influence on the ultimate destination of the rest. But the new law also means that we shall not only control more rubber, but if necessary, accumulate it. During 1915 the United Kingdom will, if the present regulations are enforced, import from the East about 72,500 tons of plantation rubber, plus a large tonnage of African and Brazilian grades. Of this I estimate that the United

Kingdom, Russia, France and Japan will require about 50,000 tons; this will leave us with over 20,000 tons minimum of plantation rubber for export to neutral nations. Such a vast surplus, increasing month by month, would mean a fall in price of plantation rubber. If plantation supplies arrive in regular quantities, and the present regulation operates throughout 1915 and no shipments are possible to the United States and other neutral countries, there is no limit to which rubber may fall in the absence of any co-operation among producers. And I have no faith in concerted action among growers except until the position of the biggest or wealthiest producers is seriously threatened. You can now see that plantation rubber could easily become unprofitable to collect. This would mean that labour on Eastern estates would have to be much reduced or put on short time, or the estates conducted as before, but at a loss. You know as well as I do that we must, as business men, be prepared to run our estates in first-class condition at a loss if it is necessary to do so. The position will remain serious until the United States of

AMERICA AGREE TO TAKE OUR RUBBER ON OUR TERMS.

The total crops I have mentioned may strike some of you as being very large; but I am not at all afraid, providing neutral trade can be maintained, and old credits are re-established. I can assure you that the manner in which credits have been affected will appreciably diminish the output, not merely from plantations, but also from wild areas, unless in the immediate future neutral nations are compelled to absolutely depend on wild rubber. Furthermore, the war has taught us the enormous importance of motor transport, in which rubber tyres are essential. There

WILL BE, AFTER THE WAR,

a boom in all manner of manufactured rubber articles; because practically every firm in the enemy countries has had its manufactured stocks depleted, as well as its supply of crude material. The wastage of rubber tyres, valves, boots, waterproof, surgical and numerous other articles, the extinguishing or disorganising of supplies from certain rubber-yielding areas previously owned by the enemy, and the necessity of replenishing stocks of crude rubber, may result in a demand of our product which will be phenomenal. The year after war terminates I fully expect that, if credits are re-established, you will have to sell Germany 35,000 tons of rubber and every Continental Power will want double the usual annual supply to make good the depleted stocks. I could relate details of how the 117 tons of Rubber in Antwerp the day after the fall of that city, were

URGENTLY PURCHASED AT 12 MARKS PER KILO. BY GERMANY,

who would have willingly paid a higher price for fifty times that amount. Some of you may be intersted to learn how I arrive at my figures for next year's crop of plantation rubber. The total will not be up to my estimate if there is any restriction of tapping operations, it will be increased if rubber rises much higher in price. It is based on the assumption that all acreages planted during and prior to 1909 will be in bearing in 1915, and after allowing for varying yields of 220 lb. per acre per annum from Java, Ceylon, South India and Borneo, of 250 lb. per acre per annum from Sumatra, and of 300 lb. per acre per annum from Malaya, the estimate totals to 72,500 tons for 1915, if tapping operations are normal. There was not any great increase in planted acreage between 1908 and 1909, hence the small estimated increase in crops. In fact, a shortage would have been likely next year, because the average rate in increased consumption would have been greater than that in plantation supplies—the only source expected to show an increase. The war may, of course, materially affect supplies from all parts of the tropical world.—"L. & C. Express" December 4.—*The Ceylon Observer.*

COLOUR INDUSTRY.

The Artificial Colour Industry and its Position in England.

By F. Mollow Perkin, Ph. D., F. I. C.

(*Continued.*)

The development of this branch of the coal tar colour industry was thus described by my father in his Hofmann Memorial Lecture in 1896:—

"Before the end of the year 1869, we had produced one ton of this colouring matter in the form of paste; in 1870, 40 tons; in 1871, 220 tons; and so on in increasing quantities year by year. As we had been successful in producing artificial Alizarin, others did not run much risk in following our lead; yet up to the end of 1870 the Greenford Green Works were the only ones producing artificial Alizarin. German manufacturers then began to make it, first in small and then in increasing quantities, but until the end of 1873 there was scarcely any competition with our colouring matter in this country."

He then went on to say—and the remarks were not only directed to his own work but to the work of other firms, notably Simpson, Maule and Nicholson, who for some years were the largest coal tar colour producers in the world:—

"From the foregoing, it is seen that, as in the case of the aniline colours, all the pioneering work connected with the foundation and establishment of this branch of the coal tar colour industry was also done in this country.

"For the due development of this industry, it was necessary not only to attend to technical processes, but also to carry on scientific research in connection with it."

The neglect of scientific research during the next decade was the reason why the coal tar colour trade, established as it was in this country, gradually got forced out by German competition.

In 1874, the Greenford Works were sold to Messrs. Brooke, Simpson and Spiller, the manufacture of Alizarin being taken over at a later date by the British Alizarin Company.

I have seen it in the Press, and have also heard it in conversation, that it was not a very patriotic step to dispose of a successful work at the early age of 36. The reasons for doing so were practically these. My father and his brother had had a very difficult fight to establish the works, and had at last reaped some benefit from their struggle. The use of aniline and Alizarin dyes was increasing with leaps and bounds, and their agents all over the country were urging them to increase their output largely. This practically meant doubling the size of the works; and this again meant that they would have to sink most of the capital which they had made, in bricks, mortar, and machinery. Although my father preferred a quiet life in which to devote himself to research work, the increasing of the works would probably not have been an insuperable difficulty or prevented him from carrying on the business: but the necessity of having more trained research chemists, if the works were to be carried on satisfactorily, became increasingly apparent. It was not possible for one brain, however energetic and fertile, to carry out all the necessary research required in a large work. Research chemists, however, could not be obtained. Our universities did not train them. True, Germans could be had at moderate salaries: but German research chemists, after they had obtained a thorough knowledge of the

processes, had a tendency to go back to their own country, where they were received with open arms and offered high salaries by the German companies.

In an industry such as that of the aniline dyes, continual change is necessary. Consequently a number of highly-trained research chemists must be employed, and it is the work which can turn out the largest number of new colours, and at the same time improve the methods of manufacture and the quality of the older ones, which will obtain the market.

This is what the Germans have done. It is not correct to say—except to a limited extent—that they have stolen the artificial colour industry from us. There certainly has been a lot of piracy. In the early days of the industry, German patent laws were, to say the least of it, chaotic, each State either having its own laws or its own ideas as to the administration of the patent laws. Therefore, for all practical purposes, no patent law existed. It followed, consequently, that the Germans had the brains of the world at their disposal and they had to pay no fees for their use. The moment a patent was published it was seized upon by the German firms. If a process was worked secretly, the Germans, either by research work or by other means, discovered it and appropriated it. The products manufactured by them were sent into this country; it was vain to prosecute their agents, because when the Germans found this was being done they supplied the goods direct to the consumers. They sent their travellers, many of them skilled chemists, all over the world. They were therefore able to show how the dyes were best employed. The British manufacturers were, as a rule, content with issuing circulars to their customers, warning them not to use inferior foreign goods. As a matter of fact, the goods, as a rule, were not inferior to the British, and were often cheaper. It is, however, an undoubted fact that the German colour works, when they were first founded, stole the work of English brains. The British Government protected their processes by allowing them to take out patents in this country in which they were not required to work. On the other hand, German patents were refused to the British inventors. This was the case with the Alizarin patents; they were granted to Germans in England, but refused to Englishmen in Gemany.

I do not think that the German competition with Alizarin was very serious until after 1874, because, up to that time it could be manufactured and sold at a good profit at a price which did not admit of much German undercutting. Shortly afterwards the prices of the Alizarin paste in this country was raised, and this gave the Germans their chance, which they seized with characteristic energy and undersold the English manufacturers. The English policy should, of course, have been in the opposite direction, to keep the price low particulary as the Germans were getting in a position to supply the whole demand, if they could only obtain the trade. As a matter of fact, by combining together, the German manufacturers for a time practically killed the British Alizarin industry, and had it not been for the Turkey Red Dyers' Association, who combined to manufacture Alizarin, the trade would probably have entirely left the country. At any rate, the Germans have made very great profits, and employed these in the first case to write off their capital expenditure and secondly to reconstruct and equip their works with magnificent laboratories, which were staffed with skilled research chemists. The patent laws, until the Bill of 1907 was passed, allowed foreign nations to patent any process in this country simply to prevent us manufacturing, while we, if we patented abroad,

must manufacture the product in the particular country in which the patent is taken out within a reasonable period, or else grant a license.

In 1907, the Patent Laws Amendment Act was passed, in which it was made compulsory for a foreign patentee, either to work his patent in this country or else to be compelled to grant a license. Unfortunately many loopholes for evading this Act have been discovered, and it has not been so successful as was anticipated.

With our own patent laws against us, the Germans made the most of it. But the German spy system, of which we have seen so much recently, was also against us. In many cases, however, our want of business method and *always our disdain of research work were against us.* After a process was once started it was, and even to-day is, largely worked by rule of thumb. I grant you there is a stirring amongst the dry bones, yes, a a great stirring, but if we are going to take our place in the manufacture of aniline dyes and fine chemicals, the stirring will require to be very much more vigorous, and unless, after being stirred the bones are going to be jointed together little ultimate good will result.

I have pointed out how the Germans, owing to our patent laws, were able to make use of our brains, and one cannot help thinking how fertile those brains were with new ideas, and with initiative to carry out the ideas from the experimental to the manufacturing stage. It must be remembered, however, that the number of these pioneers was not very great, and it is small wonder if, when they found their ideas being exploited by others, they were inclined to lose interest, and retire from the fray. Whether or not this was the case I am unable to say but in this particular line of industry we seemed to lose our pioneering interest. The existing works in some cases, at any rate, began to live on their past reputation and seemed to make very little effort to compete with their German rivals. On the business side they did not take sufficient trouble to keep their customers or to open out new markets. The dyer was told, if not in words, at any rate by action or want of action, "These colours have always been admired and have been manufactured by us for years, we don't see any reason for altering the shades or the methods of dyeing."

In the meantime, however, the Germans were flooding the markets with new dyes and new shades and sending round their travellers by the score. These travellers were not simply salesmen but in many cases trained chemists, who were prepared to go into the dyehouse and show the dyer how to apply the dyes.

The question of capital also had a great deal to do with the advancement of the artifical colour industry abroad. In this country all the firms were privately owned, being more or less family concerns. To-day this is in the main still the case. In Germany it was and is otherwise. They are big commercial concerns, supported by outside capital and also by the banks. Furthermore, a large slice of the profits has always been put by for developing the works, for new machinery, and for research work. We in this country have been too prone to take too much out of the business, instead of building up large reserves. One might say, why then was not outside capital brought in to increase the size and output of the works ? The reason probably was this -- that capital found a more remunerative opening in shipping industries and the building of docks the opening up of coal mines, in the heavy chemical trade, and in engineering concerns, etc. Also a large amount of capital was invested abroad to finance British or foreign undertakings from which good profits could be obtained.

One of the chief causes of our not being able to hold the artificial colour industry which had been found in this country, and the real cause of the German pre-eminence, and for which they deserve every honour, was the lack of industrial research. One of the reasons why so many of the students of Hofmann rose to such eminence was the love of research with which he imbued them. To-day our manufacturers are awakening to the need and value of research, but for many years, although a chemist was attached to most of the works, he had in the main simply routine work to pursue, which either gave him no time or incapacitated him for research, and this is still largely the case. Small wonder is it that our manufacturers were unable to compete with the Germans. In the German works, shortly after their foundation, magnificent laboratories with all the latest scientific apparatus were erected. Libraries stocked with the latest literature were installed—everything was there which might be required for the investigations in hand.

Having made these preparations, chemists were employed who had had a thorough training. Before they could take their degrees it was compulsory that they should carry out an original investigation along some line of research. The engineers employed were also highly trained men with a good chemical knowledge, many of them having received a university education. In the works the chemist and engineer worked hand in hand. Thus, when the chemist had discovered some new material or process in the laboratory, it was further worked out in collaboration with the engineer-chemist. The product first produced in the laboratory was next made on a semi-commercial scale, and if this proved successful, the commercial plant was erected and the material manufactured in bulk.

As the output of the works increased, so the number of chemists taken into the works increased until, as is well known, some works, such as the Badische and Meister, Lucius and Bruning employ over 200 research chemists. The fact is that almost the whole of the technical staff are more highly trained than is usually the case here. There is also in Germany a much closer relationship between the professors of chemistry in the universities and polytechnic institutes and the manufacturers. This is good for the professors and good for the manufacturers, as it reacts upon the training of the student.

How could British manufacturers who, if they did not scorn research did not recognize its value, compete under these conditions? During the last decade British colour makers have been holding their own in certain lines, and even improving their position owing to the fact that they have been increasing their technical staff. But they have been, and are, severely handicapped by the enormous German advances and by the great variety of products the Germans have been able to supply to the consumers. The agent of a German firm can go to the dyer and offer him all the shades he requires, the British manufacturer can only supply a few—consequently the German gets the order—it saves so much trouble.

There are other reasons which are more closely related to the German business methods, but I will not go into these as I do not wish to enter into controversial matters.

I am not fond of the expression, "War on German Trade." Is it not better to say: "Opportunity for British Trade and the Capture of New Markets." The Germans thoroughly deserve the preeminent position which they have attained in the artificial colour industry. It is in the main due to painstaking research, backed by thorough business organization. Some

of their business methods, it is true, are such that we should not care to see them copied here, but the main reason has been the lack of research, and of making opportunities, instead of waiting for them to come.

Did not the Germans deserve to capture the Indigo industry? The research on this subject was carried out on a truly colossal scale. Many chemists were engaged for a period of over 20 years upon research work in order to produce this product synthetically on a commercial scale at a price which would compete with, and even undersell, the natural product. It is stated that before a single pound of synthetic Indigo was placed on the market over £1,000,000 had been spent during the 20 years. The literature, patent and otherwise, upon the subject is one of the finest chapters in the history of chemical technological research. It is not my intention to enter into the details of this magnificent work—time will not permit, and most of you are familiar with it. Had the Indigo planters not been so sure of their position, they would—when the first discovery of synthetic indigo was announced in 1878—have carried out experiments to see if they could not improve the quality of their product, but they sat by with folded hands. When it was too late they cried out that the introduction of synthetic Indigo was a bolt from the blue. They should have watched the signs, in which case they would not have been so surprised; aye, they might even have arrested or retarded the falling of the bolt.

I have given some of the chief reasons why the artificial colour industry was lost to this country. There is, however, another one. In the preparation and purification of some of the dyes, it is necessary to employ large quantities of pure alcohol. The enormous cost of pure alcohol in this country, compared to its cost in Germany, owing to Government duty and excise restrictions, has made its use on a large scale prohibitive, and has most certainly been a contributory cause in helping the German manufacturers. Within the last few years these restrictions have been considerably mitigated—largely owing to the persevering efforts of Mr. Thomas Tyrer. Unfortunately much yet remains to be done. Although Government has given relief, the officials who have to administer the Government Acts seem to forget they are public servants placed there for the good of the country. Several manufacturers to my knowledge, after inquiring into the matter, found the use of alcohol so hedged and bound about with red tape and officialism, that they were unable to take advantage of the Act. In the fine chemical trade, that is, the manufacture of drugs and photographic chemicals, the use of pure alcohol is of even greater importance than in the colour industry. The fine chemical trade in synthetic drugs and photographic chemicals never has been a British industry. It is entirely due to German research work; and we have never tried to develop it here. It is, however, a very important industry, there is no reason why it should not now be developed, at any rate in a partial state in this country. Alcohol, however, is a very important reagent for this industry. British manufacturers can produce good cheap alcohol, if there is a demand for it; but while its use is hedged with difficulties, those who use it will employ it in minimum quantities only. Like most commodities, it can be made more cheaply in large than in small quantities.

Let me now briefly summarise the causes which have led or contributed to the present position of the artificial colour industry in this country.

(1) The character of the British patent laws and the want of patent laws in Germany, whereby the Germans were able to exploit our brains.

(2) Slackness on the part of the early British manufacturers (after a certain period of prosperity.)

(3) *Industrial chemical research carried out in Germany, but neglected by us.*

(4) German business organization.

(5) Restrictions on the use of alcohol.

That the artificial colour industry is in a bad position is self-evident. A devastating war has broken out, stopping our supply of imported colours, and what is the result? There is a dye famine. Dyers cannot carry out their contracts because, although willing to pay almost any price, they cannot obtain the dyes. It must be remembered also that aniline dyes are used for a great many purposes other than that of dyeing textiles. Paper, leather, bones, feathers, straw, grasses, etc., are all dyed with aniline dyes. They are employed for dyeing wood, particularly in the furniture trade. Very large quantities are used in paints in the form of lakes. Even in confectionery they are employed. All these industries are hit.

So dependent, indeed, are our manufacturers upon dyes, that the stoppage of the supply is beginning to cause great distress amongst thousand of our workers, and this distress will increase as the available supplies are used up. Colonel H. A. Foster recently pointed out, before the Bradford Chamber of Commerce, that although the value of the dyes imported might not exceed £2,000,000 to £3,000,000,per annum, yet taking textiles alone it involves indirectly a turn-over of about £100,000,000. If we take into account some of the other uses which I have mentioned, this enormous sum must be greatly exceeded.—*The Indian Planters' Gazette and Sporting News.*

(To be continued.)

Tea

Indian Tea.—No sales have been held since Monday, December 21 when about 46,000 packages were offered. The market closed for the Christmas holidays with a very firm tone, and at the opening sale of the New Year, which will be held on Monday, January 4, there is likely to be a very active demand. There is a wide-spread general enquiry, in addition to which there are havy Government requirement, and a strong market is expected. Some 68,000 packages are catalogued, including a considerable quantity of flavoury Travancores.

Ceylon Tea.—No auctions have been held this week, and with no offerings privately, business has been restricted. The market re-opens on Tuesday next, when about 30,000 packages will be offered, and a good demand is expected.

China Tea.—Business has been restricted, mainly because offerings have been very limited and the selection poor. Moning Siftings under 7*d.* have been dealt in, and also a few parcels of low Moning about 7½*d.* Fine and finest Kintucks and Keemuns have been enquired for and are slightly firmer.

Java Tea.—No public sales have been held, but the private market remains unchanged and firm.

London Tea Returns.

	Duty Paid.		Export.	
	1913.	1914.	1913.	1914.
	lbs.	lbs.	lbs.	lbs.
For week ended Dec. 26th ...	1,509,403	1,982,514	558,693	412,314
For 52 weeks ended Dec. 26th ...	274,041,959	287,284,792	56,704,849	67,655,633

—*The Produce Markets' Review.*

CORRESPONDENCE.

No. 40/1915.

Office of the Planting Expert,
Bangalore, 18th January, 1915.

Spraying for Green Bug.

To The Editor,

The Planters' Chronicle.

Dear Sir,—With reference to Mr. Roger's letter on this subject in your issue of 16th January, the cost of the new Fish Oil Resin Soda Soap per gallon of spray must be left open for the present until the trials which the Scientific Assistant is making with it are finished.

In the meanwhile I should like to ask Mr. Rogers a few questions about the mixture he recommends, *viz* :—

English Soft Soap	...	10 oz.	Rosin	...	6 oz.
Soda ash	...	2½ oz.	Refined Saltpetre	...	1½ oz.

First of all what is the object of including Saltpetre in this formula? It is the most expensive item and can have little or no effect upon the Scales, while it will not dissolve Rosin which is the object of the Soda. A mixture of Soap, Soda and Rosin is quite effective as an insecticide and it seems to me that Saltpetre is a needless expense.

Mr. Rogers says, "for spraying Soda Ash should be increased to 4 oz. and the saltpetre omitted." Why?

If Saltpetre is necessary when brushing why is it omitted when spraying? Surely the reverse should be the case since I am always being told that brushing is far more effective than spraying.

Again with regard to the Soda Ash. This is used merely to dissolve the Rosin and any excess of free soda should be avoided as it burns the foliage, a fact which has been proved time and again.

If in the first instance Mr. Rogers finds that 2½ oz. of Soda ash is sufficient to dissolve 6 oz. of Rosin why is it necessary to increase it to 4 oz. in a mixture for spraying? Surely this will cause the Soda to be in excess.

I should be much obliged if Mr. Rogers could be good enough to enlighten me on these points.

I remain,

dear Sir,

Yours faithfully,

Rudolph D. Anstead,

Planting Expert.

Science and Coffee Making.

Professor C. V. Boys, speaking recently before the Royal Institution on "Science in the Kitchen," said, "The making of coffee in the Oriental manner with cold water was advocated on the ground that when boiling water is used everything that is volatile, including the aroma, is lost, and only the bodies of the albumen tupe left behind."—*The Produce Markets' Review.*

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs. is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry* should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them. or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 6.] FEBRUARY 6, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Planting Expert is on tour in the Kadur District, but has left an article, which we publish to-day, and refers to a Bulletin on Coffee cultivation which he has prepared, on which we hope to publish a criticism in our next issue. Those who wish to purchase it for the small sum of two annas can do so by applying to the Director of Agriculture, Mysore Agricultural Department, Bangalore. Included in this article is an interesting summary on the Rubber and Tea Markets during 1914.

We publish the proceedings of the Annual General Meeting of the Central Travancore Planters' Association.

We conclude the interesting article on "Colour Industry," for which we are indebted to the *Indian Planters' Gazette* and *Sportiag News*. It is to be hoped that English manufacturers will not only capture this market now but retain it. Those who have studied German methods of subsidizing their industries and commerce, must hope that in the future the Imperial Government will give an equally liberal support to home industries. On the discussion that followed the reading of the paper there was great unanimity of opinion.

The Labour Department published from the *Times of Ceylon* an extract on "Immigrant Cooly Traffic," showing the popularity of the Indo-Ceylon Railway.

We draw attention to the forthcoming tour of the Director of the Labour Department, which commences on February 9th and continues until the 26th. All the halting places mentioned except Saklaspur and Bangalore, are in the Kadur District.

We also publish an extract from the Madras G. O. Judicial, a list of names of those gentlemen authorised to witness the execution of labour contracts.

Mr. Gerrard Rogers send us another letter on spraying for Green Bug, and his experiments are certainly useful and satisfy himself, which is the main point, and we hope, he will furnish us with further information as to results, which are of intense interest to those fighting the Green Bug. The Editor can procure half dozen sprayers for those who may be in want of them.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

A Bulletin on Coffee Cultivation.

At an Extraordinary General Meeting of the U. P. A. S. I. held in March, 1914, a resolution was passed asking the Mysore Durbar to increase their contribution towards the Scientific Department. This the Durbar kindly consented to do and at the same time they expressed the hope that the Planting Expert would co-operate with the Agricultural Department of the Mysore State in making his experience available to Indian planters in Mysore.

Commenting upon this the Planting Expert writing to the Secretary of the U. P. A. S. I. from London in June said "I can assure the Durbar that it is and always has been my sincere wish and earnest endeavour to co-operate with the Agricultural Department of the Mysore State in all work connected with my Department and I shall most heartily welcome any suggestions from the Mysore Agricultural Department as to how this co-operation can be made more close and effective for the mutual advantage of both Departments."

By way of giving practical effect to this expression, at the suggestion of Dr. Coleman, the Director of Agriculture of the Mysore Agricultural Department, the Planting Expert has prepared a paper dealing with Coffee. Cultivation and Manuring embodying his experiences of this crop and his recommendations as to manurial treatment, &c., much of which has from time to time appeared in the *Planters' Chronicle*. This has been published by the Mysore Agricultural Department in the form of a Bulletin which has just made its appearance.

This Bulletin may be obtained free of cost by all Agriculturalists in the Mysore State. Those outside the State can obtain the Bulletin at a price of two annas. Application for this publication should be made to the Director of Agriculture, Mysore Agricultural Department, Bangalore.

Rubber and Tea Markets during 1914.

I am indebted to the *Madras Mail* for the following interesting summary of Messrs. Gow, Wilson, and Stanton's Annual report.

No large increase in the production of Rubber took place in 1914, the world's output being about 107,000 tons, approximately the same as in 1913. This is largely attributed to the War but it is also partly due to the deliberate restriction of output by many companies at the beginning of the year. In 1913, the production of Plantation Rubber was 46,000 tons and in 1914, it totalled about 65,000 tons. Thus the East now supplies more than 60% of the world's output. During the year fluctuation in prices were less marked than in 1913, when standard crepe ranged between 4*s*. 6½*d*. and 1*s*. 11½*d*. In 1914, the highest and lowest figures wers 3*s*. and 1*s*. 11½*d*. respectively.

In the case of Tea the most remarkable feature of the market during 1914 was the sustained demand in spite of the outbreak of the War. The year opened with a very strong position, duty payments for 1913 having increased by some 10 million pounds over 1912, and consumption per head of population having advanced from 6·46 lbs to 6·61 lbs.

A very satisfactory level of price has been maintained throughout 1914, especially for useful common and lower medium sorts; any considerable decline, such as that which occured towards the end of September, being only of short duration.

During the latter half of the year, the outbreak of War in Europe and the interference with shipments from both India and Ceylon made market conditions abnormal; an extensive demand from near Continental countries, combined with smaller offerings at a period when the trade is usually fully supplied, resulted in a very considerable rise in price, especially for leaf descriptions, and during the first week of November clean common leaf touched the high level of 9¼*d*, a figure not reached since June 1891.

The stringent regulations as to exports to Holland, Norway, Sweden, and Denmark made on 17th November, at once caused a sharp reaction; prices gave away for some of the better leaf kinds as much as 1*d*. to 1½*d*. per lb. within a week, while the increase of the duty from 5*d*. to 8*d*. also brought about a quieter demand for finer and tippy descriptions. On the whole the market, however, has been in favour of the producers.

Imports of all Tea to the United Kingdom for 1914, were smaller, being 344,750,000 lbs. against 366,023,125 lbs. in 1913, while deliveries, both for the home trade and export, were considerably larger, and stocks on 31st December, 1914, show a large decrease. The average price of Indian tea sold on garden account for the year was 9·13*d*. as against 9·11*d*. for 1913, while that of Ceylon was 9·04*d*. against 8·98*d*.

Notwithstanding the generally high level of prices the cost to the consumer has not been increased, and the total deliveries of all growths for home consumption mark a record. Duty was paid on 318,000,000 lbs. as against 305,530,044 in 1913, an increase of 4%. The outbreak of the War in August and the regulations passed against exports in November have naturally reduced the export of Tea for the year considerably, but, despite this, exports of Tea from the United Kingdom during 1914, were on a large scale, marking an increase of 11¼ million pounds over those of 1913, namely 54,000,000 lbs. as against 43,755,313 lbs. in 1913.

RUDOLPH D. ANSTEAD,
Planting Expert.

In the Diplomatic & Consular Report (No. 5400) dealing with the trade and Commerce of Leghorn for 1913 it is stated that the Imports of Coffee into that place were in 1912, 36,380 cwts, valued at £128,379 of which only £49 worth was obtained from British sources. In 1913, 336 cwts, of coffee were imported from British sources out of a total import of 20,055 cwts.

THE FEDERATED MALAY STATES.

Rubber Exports During October and November, 1914.

The following figures of the exports of cultivated rubber from the Federated Malay States during the months of October and November, 1914, are taken from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for October and November, 1913, being added for purpose of comparison:—

	1913.	1914.
	Tons.	Tons.
October ...	2,160	2,897
November ...	2,062	2,889
January-November ...	20,847	27,360

—*The Board of Trade Journal.*

DISTRICT PLANTERS' ASSOCIATIONS.

Central Travancore Planters' Association.

The Annual General Meeting of this Association was held on Saturday, 16th January, 1915 at the Travellers Bungalow, Peermade, at 10-30 a.m.

PRESENT.—Messrs. H. C. Westaway (Chairman), W. H. G. Leahy (Vice-Chairman), F. Bissett, J. S. Wilkie, H. C. Bracher, A. R. St. George, C. A. Mackenzie, W. A. J. Milner and R. P. Roissier (Honorary Secretary).

The notice calling the Meeting was read.

The Minutes of the last Meeting were taken as read and confirmed.

CHAIRMAN'S ADDRESS.

Gentlemen,—I do not propose giving you a long speech and resumé of what has happened during the past year. As you all know it has been very eventful and I am sure we all hope that this terrible war which is now raging will soon be over. As regards ourselves I do not think we have any cause for complaint. Prices have been good and crops secured more than up to the average. What prices will do in the future I leave it to others to predict. We have the extra duty to take into consideration and you will remember that when this was put on during the Boer War prices dropped considerably. At the same time statistics were nothing like so favourable as they are at present and I am not sure in my own mind that it was not over-production then, which made prices drop as much as anything. We hear that Tea is now allowed to be exported again and that the Russians have turned teatotallers so I think we can reasonably expect tea to stay somewhere about where it is for sometime.

Before tending my resignation I should like to thank you all most heartily for the great assistance you have given me during the year and especially the Committee and Honorary Secretary. This latter gentleman has had a very hard time of it and especially at the outbreak of war when we were threatened with a great increase in the price of food stuffs and a rice famine but thanks to his energy these were all averted.

Might I ask you, gentlemen, to remember that his is a voluntary job and that we can help him a lot by filling in and returning the forms which he sends us by return of post and also in sending in cheques in payment of accounts. It is just these little things which make his life a burden and delay matters a lot.

I should again like to thank you all for the honour you have done me in electing me you chairman and hope you will overlook all shortcomings. With these few words I beg to tender my resignation.—(Applause.)

HONORARY SECRETARY'S REPORT.

Mr. Chairman and Gentlemen,—During the year under review we have held four General Meetings and six Committee Meetings.

Labour Rules.—The same Rules as existed were carried on during the year.

Labour Department.—During the year we have seen the Labour Department of the U. P. A. S. I. started and we wish this Department all success. As you know, the acreage support given by this District is 5380·03 acres.

Roads.—The Travancore Government has been carrying on extensive repairs on the Kottayam-Kumili Road but there are still parts of this road in need of attention. Our Delegate for the forthcoming Sri Mullam Popular Assembly will be bringing this forward as one of his subjects.

War Subscriptions.—Since the outbreak of the War this Association has subscribed from subscriptions received from the Staff and Coolies of various Estates, the sum of Rs.740-15-5 to the Imperial War Fund. The Members have subscribed Rs.150 to the Prince of Wales' Relief Fund and Rs.150 to the Imperial War Fund. I have still in hand the sum of Rs.232 and as settled at our last Meeting, it is for us to decide to-day to what Fund this will be sent.

Membership.—The Association consists of 14 Members. The Firm of Messrs. Aspinwall & Co., Ltd. was elected as a Member during the year. The declared acreage of the Association is 5931·25 acres.

Crop.—I regret being unable to give you the crop for the past year as all the returns have not yet been sent in to me.

Accounts.—Mr. Bissett has kindly audited the accounts and I lay these on the table.

Before concluding I should like to thank the chairman and the Committee for the support they have given me and I wish to thank you, Gentlemen, for having elected me as your Honorary Secretary. I have now been elected by you on three consecutive occasions and I appreciate very much the honour you have done me. I have found the work most interesting and have enjoyed it. I think, however, that the time has come when you should make a change and give someone else the opportunity of taking this post and I therefore do not seek re-election. I thank you again, gentlemen, and I now beg to tender my resignation.

Correspondence.—Reader letter from the Chief Secretary to Government No. 8261 of the 23rd. Decemoer regarding the Kodimatha Landing. The Honorary Secretary was instructed to write and thank Government for kind support and assistance given us in this matter.

Read letter from Mr. Richardson of the 14th December on the subject of a water ballast road roller. It was deceided that this be deferred.

Read letter from the Director of Labour Department dated 4th January.

All correspondence regarding the Grant in Aid Dispensaries received from the Durbar Physician was read.

Read letter from the Director Labour Department dated 28th Novemnber

All correspondence from the Secretary. U. P. A. S. I. and circulars were read.

Gift of Tea to the Russian Troops.—Read letter from the Vice-Consul for Russia, at Colombo, dated 16th November, 1914, regarding the proposed gift of tea. The Chairman addressed the Meeting on this subject and after discussion it was agreed:—

That the Managers of proprietory Estates present were prepared to subscribe at the rate of 2 lbs. of Tea per acre as a gift to the Russian Troops and regret that the Companies in the Association cannot see their way to support this movement,

Sri Mullam Delegate's Instructions.—The Delegate was given instructions on the subjects to be brought forward.

Mr. Leahy proposed that Mr. Wilkie, the Sri Mullam Delegate, be given Rs.50 towards expenses. Seconded by C. A. Mackenzie and carried.

Fitter and Forge.—Read letter from Mr. Cantlay regarding the Fitter and Forge and his acoounts were laid on the table.

A vote of thanks was passed to Mr. Cantlay for all his trouble in connection with the Fitter and Forge during the past year.

Labour Rules and Rates.—Mr. Bissett proposed that "In Rule 3, para. I, the period of three months be altered to six months." Seconded by A. R. St. George.—Carried.

Mr. Leahy proposed: "That the Labour rules and rates be carried on for another year." Seconded by W. A. J. Milner.—Carried.

Finance and Subscriptions.—The Honorary Secretary having explained what was estimated for during the coming year, it was resolved that the subscription for 1915 be at the rate of 3 annas per acre.

The accounts as audited by Mr. Bissett were laid on the table and passed.

War Subscriptions.—It was agreed that the balance which the Honorary Secretary has in hand on the C. T. P. A. War Subscription account be sent to the Belgian Relief Fund.

Election of Office Bearers.—The following gentlemen were elected as office bearers for the year 1915:—

Chairman	...	Mr. H. C. Westaway.
Vice-Chairman	...	Mr. W. H. G. Leahy.
Honorary Secretary	....	Mr. R. P. Roissier.
Committee :	...	Messrs. F. Bissett and J. S. Wilkie.

Mr. Westaway thanked the Members for the honour they had done him in re-electing him as their Chairman—Applause.

Mr. Roissier also thanked the members for re-electing him as Honorary Secretary and said that he had hoped that they would have elected somebody else but as they had re-elected him he thanked them very much for the honour and would do his best.—Applause.

Mr. Leahy addressing the Meeting said: —Gentlemen,—I am sure you would like me to say a few words of thanks to the Chairman and Honorary Secretary. Our worthy Chairman has had a great deal to attend to during these troublesome times and we are all due him our thanks for his past services and we are very glad that he is taking on the Chairmanship again. And I should like to refer to our Honorary Secretary's long and faithful services and thank him very much indeed for what he has done. I am sure we are all very pleased that he is to carry on for another year.—(Applause.)

This concluded the business of the day and the meeting terminated.

REGINALD P. ROISSIER,
Honorary Secretary.

COLOUR INDUSTRY.

The Artificial Colour Industry and its Position in England.

By F. Mollow Perkin, Ph. D., F. I. C.

(Concluded.)

The British colour makers are increasing their output, but since before the war they were supplying only about 15 per cent. of the amount used in the United Kingdom, it is obvious that they will not be in a position for a long time to meet the demand. Furthermore, the Germans manufactured very large quantities of dyes which have never been made here.

What, then, is to be done? I notice that the Bradford Chamber of Commerce unanimously passed a resolution on 27th October, "urging upon His Majesty's Government the vital necessity for immediately adopting measures for furnishing such support as is essential to the establishing and effectual continuance of the manufacture of aniline dyes upon an adequate scale in this country."

To my mind, the most important part of the resolution is contained in the words "and effectual continuance of the manufacture of aniline dyes." It is very doubtful if the Government would feel they could see their way to financing any particular industry. They will say, if we do it to one, we may be asked to do it to all, and how are we to discriminate? On the other hand, if the industry is founded, it is the bounden duty of the Government to see that is not stifled again at the end of the war.

Capitalists who might be willing to risk their money in putting up colour works say: But what is to happen after the war? The Germans will again flood the market and undercut. In all probability they have accumulated supplies and will be willing to get rid of them at almost any price. Will the Government guarantee that for a certain number of years all dyeing which is done for Government Departments shall be dyed only with British-made dyes. If the Government agree, and the manufacturers and users of this country should compel them to agree, what about other than Government users? Will they rush back to buy in the cheapest market, because it goes without saying that in most cases, for some time at least, the British dyes will not be so cheap as the German, owing to the enormous experience the latter have behind them. On the other hand, in our gas works we have a great deal of the raw product necessary.

My own feeling is that a large portion of the raw products should be made by some of our large gas works, that is to say, those which have tar distilling plants. They have there, in their works, the benzol, toluol, naphthalene, anthracene, etc. With regard to the last-named substance—anthracene—the British Alizarin Company can probably deal with it better than anyone else, but they will require increased supplies.

Why should not nitrobenzene, aniline, and some of its derivatives nitrotoluene, toluidine, the naphthols, naphthylamines, phathalic anyhydride, and many other substances, which are the raw materials for the colour works, be made at the source of supply of the raw products for their manufacture? About 10,000,000 gallons of benzene are produced annually, and before the war two-thirds of this went to Germany, a portion of which they used for making aniline.

The question is one bristling with difficulties, but it is of instant urgency. Some suggest the establishment of huge works comparable to those of the Badische of Meister, Lucius and Bruning (forgetting that those

were built up from comparatively small beginnings), which will manufacture every type of colour and also fine chemicals, a scheme which would mean in the long run a huge financial disaster. Others think that a number of small firms should be founded which would manufacture certain specific ranges of colours. This certainly is more feasible.

My own feeling is that those firms now manufacturing should enlarge their output and obtain leave to work certain German patents; that many of the raw products should be manufactured at one or two of the great gas works who might, after their plant was working, also make certain dyes and gradually branch out; also that a few new companies with carefully thought-out programmes should be started.

Now in connection with the protection of the industry I wish to say another word. We will presume that the Government will only allow the use of British-made dyes. How about the other consumers? It will be very difficult to bind them. The best solution of the problem would be to give them, or rather get them to take, an interest in the new works, or for the matter of that; in the old ones. This was done by the Turkey Red Dyers' Association who, in order to prevent the manufacture of Alizarin leaving the country, founded the British Alizarin Company, and agreed to take so much of the output. They were thus not dependent upon the Germans, and also had an interest in the manufacture of the product. Cannot the general dyes do something similar?

In conclusion, I wish to say just one word as to the revocation of German patents. After war was declared, the Home Office revoked all German and Austrian patents, as and during the continuance of the war. It was also stated that in certain cases licenses would be granted to British manufacturers to take up and work these patents. I was informed recently by an eminent patent lawyer and by one of the largest patent agents in London, that the granting of licenses is practically a dead letter. Further, that where licenses have been granted, a royalty is reserved for the enemy, and there is no certainty that those who have obtained a license during the war will be allowed to work the patent after the declaration of peace.

If the trade is to come to this country, and to be retained by it, it is of vital importance that these matters be cleared up and the Government must help.

Discussion.

The Chairman said they were glad to have from so authoritative a source an accurate account of the reasons which had led to the manufacture of dyestuffs largely locating itself in Germany. Many people seemed to think that the colour trade in Germany had been fostered and helped by the Government in a manner which was quite out of proportion with the truth, and those of them who had seen the little jubilee books recently issued by some of the German firms who had celebrated their fiftieth anniversary would know quite well how true was the Lecturer's statement that most of these firms started on the most insignificant scale. They were honoured by the presence of a distinguished visitor from a neighbouring city, the Lord Mayor of Leeds, and he should like to convey to Mr. Bedford the heartiest congratulations of the Society that he should have been elevated to that post. Mr. Bedford's name was known to everyone connected with the industry.

The Lord Mayor of Leeds (Mr. J. E. Bedford) in moving a vote of thanks to the Lecturer, thanked the Chairman and the meeting for their congratulations. It was particularly interesting to hear the early history of

this subject from the lips of one who bore the honoured name of Perkin. He thought it was their duty to recognise the scientific and business-like manner in which Germany had conducted and developed this important industry. When the present crisis developed the Government had very promptly set up at the Board of Trade a Chemical Products Committee, and called together eminent business and scientific men to discuss the matter, and see how the stoppage of the textile and printing industries could be avoided. He himself had been summoned to meet the Committee that day, but he had received the notice too late to go, and was therefore able to attend that lecture. Personally he felt, and he thought they would all feel, that it was a very urgent question. Some of them had taken the view that it would be absolutely necessary, in order to build up and foster this industry, for the Government to give some form of protection.

He himself had suggested at a meeting of the Leeds Chamber of Commerce that we should have to put a protective duty of about 25 to 30 per cent. on imported aniline dyes, and his friends had reproached him with the fact that he was a Liberal Free-trader, and was now turning Conservative. He had replied: "I am still a Free-trader, but in extraordinary circumstances and in time of war you must adopt war methods." The Government might probably be willing to grant a loan in order to start the industry, the loan to be repaid after a certain number of years. As the business extended, probably the investing public, knowing that aniline colour-making was a profitable industry might be willing to take shares, and the Government loan might be repaid. In that case it would be perfectly safe, because the Government loan would appear to be something in the nature of debentures which could be realised. He believed they had in England a sufficient number of highly trained chemists to develop the industry. He was certain that there were certain of the simple colours which could be tackled at once if the requisite amount of capital were available. In Leeds, and no doubt to a greater extent in Bradford, where the dyeing industry was so enormously important, they regarded it as very desirable that they should have some settled understanding with the Government.

Professor W. M. Gardner, in seconding the vote of thanks, said that Dr. Perkin had given them a very interesting summary of the history and the present position of the coaltar colour industry, but one point which appeared to him worthy of mention, and which was not included in the list of reasons given for the loss of the industry, was perhaps a fundamental one. Dr. Perkin had to some extent touched upon it when he mentioned that in the development of the synthesis of Indigo upwards of £1,000,000 had been spent in experiment before any return was obtained. It appeared to him that this would have been quite impossible in England, because the investing public would never had supported an expenditure of any such sum. Want of knowledge and of interest on the part of the investing public had been one not unimportant cause why companies had not been formed for the development of the industry in this country. There were other reasons why it was peculiarly difficult to regain the industry, and here again he should like to touch upon a point which the Lecturer, no doubt from lack of time, did not mention; and that was the important way in which secondary and subsidiary interests had been built round the great coaltar colour industry of Germany, such as the manufacture of synthetic medicines and synthetic scents and flavourings, on the one hand, and the manufacture of necessary reagents, such as fuming sulphuric acid, on the other. These had put the industry in Germany in an extremely strong position, because before we could hope successfully to compete with them we should have to launch out, not only in the manufacture of colours, but in many other

directions, so that altogether an enormous outlay of capital would be required. With regard to the inquiries which were in progress touching the development of the dye industry in this country, it should not go without mention that the Society of Dyers and Colourists were taking their part in that movement. The Council had appointed a very influential Committee, called the Dyewares Supply Enquiry Committee, which had held a number of meetings and had accumulated a great deal of most valuable information; and in his opinion the matter had reached a stage which was more developed than was generally appreciated. It was possible, now that the information had been got together and the ways and means were being considered, that they would see some important development at a not very distant date. He thought they could congratulate themselves on the successs of the meeting, and they were all indebted to the Lecturer, who had come from London to this important centre of the application of dyes for the purpose of giving a lead to public opinion—for he regraded it in that light—as to what was essential in the furtherance of the development of the dyeware industry in England. The public must recognise that it was a most complicated question, and one which would require not only great enterprise and co-operation on the part of manufacturers and consumers, but would almost inevitably require some assistance from the Government.

The vote of thanks was carried amidst applause.

The Lecturer said he wished to thank them for the very kind way in which they had spoken. The subject was so big that he was afraid of digressing on side issues, but he quite agreed with Professor Gardner that one of the reasons why the industry had become so great in Germany was the working up of by-products. What was waste in one product was the starting-point in making another product, and if they were going to manufacture successfully in this country they must pay attention to that fact. It was no use saying they would manufacture this or that dye and neglect all its by-products. If they did the cost of the dye would be out of all proportion to its cost as it was manufactured abroad. The financial side was a very difficult one. But if the matter was approached properly he believed some of the very big gas companies might be able to find money out of their profits to make a good start if they worked things from a sound commercial point of view.

Mr. C. R. Hindley moved and Mr. John C. Oxley seconded a vote of thanks to the Chairman.—*Indian Planters' Gazette & Sporting News.*

CEYLON.

Rubber Exports in September.

The following statistics of the exports of rubber of domestic production from Ceylon during the month of September and the nine months ended September, 1913 and 1914, have been extracted from official returns issued by the Ceylon Governmont :—

To	September 1913. Lbs	September 1913. Lcs.	Jan.—Sept., 1913. Lbs.	Jan.—Sept. 1914. Lbs.
United Kingdom ...	1,618,745	1,561,404	9,410,716	12,741,898
United States ...	470,327	726,585	4,655,094	5,787,462
Other countries ...	505,961	202,048	3,416,914	4,236,338
Totalal exports of rubber of domestic production ...	2,595,033	2,490,037	17,482,724	22,765,698

—*Board of Trade Journal.*

LABOUR DEPARTMENT.

Immigrant Cooly Traffic.

POPULARITY OF INDO-CEYLON RAILWAY.

The number of immigrant coolies arriving at and leaving Colombo *via* Tuticorin during last November was 126 and 22 as against 5,613 and 5,941 in 1913 making the total for the last eleven months 18,368 and 19,809 as against 114,351 and 84,993 of the previous year. The balance of departures over arrivals is therefore 1,441 whereas last year there was a balance of arrivals over departures to the figure of 29,358.

The traffic on the Indo-Ceylon Railway Connection shows 3,422 arrivals and 4,553 departures for the eleven months being respectively 57,180 and 27,314 leaving a balance of arrivals over departures of 9,866.

With regard to miscellaneous deck passengers coming and going by way of Tuticorin, the figures are 942 and 601 for last November against 1,293 and 3,941 for the same month in 1913. The totals for Tuticorin route therefore are 28,337 and 32,595 as against 51,702 and 42,731 for the eleven months of last year and 1913 respectively, giving a balance of departures over arrivals of 4,258 for 1914, with a balance of arrivals over departures of 8,971 for the previous year. The number of miscellaneous passengers arriving by train last November was 4,090 while 3,825 returned to India. During the eleven months, 47,331 passengers arrived, against 56,453 departures, giving a balance of departures over arrivals of 9,122.—*From the Times of Ceylon.*

Labour Department.

The Director of the Department will make the following tour this month in Mysore State subject to alteration and amendment in details :—

Tuesday	9th	February	... Suntaveri.
Thursday	11th	,,	... Chickmagalur.
Friday	12th	,,	... Balehonur.
Saturday	13th	,,	... Sallebile.
Sunday	14th	,,	... Koppa.
Wednesday	17th	,,	... Kalasa.
Saturday	20th	,,	... Mudigere.
Tuesday	23rd	,,	... Saklaspur.
Friday	26th	,,	... Bangalore.

He will be glad to meet all gentlemen who wish to see him during the time at his disposal.

(Signed) AYLMER Ff. MARTIN.

Bangalore, 1st February, 1915.

Labour Department.

Extract from Madras G. O. No. 86 Judicial dated 15th January, 1915.

The following notification will be published in the *Fort St. George Gazette* in English, Tamil, Malayalam and Canarese. The notification will also be republished in the District Gazettes of Malabar, the Nilgiris, Coimbatore, Ramnad and Tinnevelly :—

NOTIFICATION.

Under section 4 of the Madras Planters' Labour Act, 1903 (I of 1903), the Governor in Council is pleased to authorize the following persons to witness the execution of labour contracts :—

1. Mr. Aylmer Ffulke Martin, Director of the Labour Department, United Planters' Association of Southern India (Incorporated), Bangalore.

2. Mr. Edward Henry Francis Day, Deputy Director of the Labour Department, United Planters' Association of Southern India (Incorporated), Coimbatore.

3. Mr. Christopher Eric Ley Ward, Superintendent of Labour Department, United Planters' Association of Southern India (Incorporated), Martinpuram, Srivillputtur.

4. Mr. Charles Symonds Prince, Superintendent of Labour Department, United Planters' Association of Southern India (Incorporated), Nagercoil.

(True Extract.)

(Signed) AYLMER Ff. MARTIN,
Director,

The recent appointment of the Director of the Labour Department and his European Assistants to attest contracts under the Madras Planters' Labour Law will be a considerable advantage to subscribers working under that Act. (ED.—*P. C.*)

COFFEE.

The Produce Markets' Review writes:—As was expected, a few auctions were held recently in London. They consisted mainly of Colombian and Washed Dumont, together with some Central American that would be taken by the export trade only. As this outlet is almost closed, there was a very slow demand, and only a very small percentage was sold. At the same time, much more would have been disposed of had the merchants been willing to accept a reduction; many were holding for the prices current before the war, and although bids were within 2*s.* or 3*s.* of those rates, they were not accepted. Since the auction some lots have been disposed of, but the whole result has not induced other merchants to make further offers. The Dumont Company being ready to meet the situation, accepted about 4*s.* below the previous prices. There has been some business privately in fine Costa Rica and East India at 80*s.* and upwards, and very good prices have been obtained. It is generally admitted that the stocks of such quality are by no means large, and will certainly be wanted before the new crops can arrive.

LONDON COFFEE RETURNS.

	Home* Consumption.		Export.		Stock.	
	1914.	1913.	1914.	1913.	1914.	1913.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
For week ended Sept. 26th ...	196	279	173	742	20,643	13,430
For 39 weeks ended Sept. 26th ...	11,621	11,441	19,220	15,756	...	...

* The Home amount contains a proportion for Export delivered by cart.

CORRESPONDENCE.

Adderley Estate,
Coonoor P. O.,
1st February, 1915.

Spraying for Green Bug.

To The Editor,

The Planters' Chronicle.

Bangalore.

Dear Sir,—With reference to Mr. Anstead's on Green Bug mixture in your issue of 30th ultimo, I should think it hardly necessary to explain that Saltpetre would destroy the copper of the sprayer, hence my remark that I increased soda ash to make up the strength of the mixture for spraying as 4 oz. takes effect sooner than 2½ oz.

As regards the expense, saltpetre costs 2½ pies per 4 gallons mixture out of a total cost of about 3 annas.

I do not profess to know what are the chemical actions of the various ingredients, but I know what kills the scale and have given you particulars of the mixture I use.

Mr. Anstead asks why I use saltpetre at all! Because I find the mixture more lasting, adhesive and quicker in taking effect for brush work than a mixture with 2½ oz. soda ash and no saltpetre, the difference is even discernible to the unobservant cooly. I write only from practical experience, perhaps Mr. Anstead would give a scientific explanation if it be needed.

A field I brushed in January has had 15 inches of rain on it after treatment, but the leaves are still sticky and the smell of the mixture has not yet left the field.

I have used over 10,000 gallons of two mixtures without burning any foliage, so I do not consider soda to be in excess.

I have been advised that amber coloured soft soap is unprocurable in England as this colouring is done with Electrolytic Chlorate of Potash which comes from Germany only, but English manufacturers are turning out a white soft soap, a sample of which has been shipped to me to experiment with.

I was so satisfied with the results obtained with the amber soft soap that at the outbreak of the War I bought up all the available supply.

I am, dear Sir,

Yours faithfully,

L. A. Gerrard Rogers.

FEDERATED MALAY STATES.

Rubber Exports during November, 1914.

According to telegraphic information received by the Malay States Information Agency in London the export of cultivated rubber from the Federated Malay States during the month of November, 1914, amounted to 2,889 tons, as compared with 2,052 tons in November, 1913. The figures for the exports during October have not yet been received.—*The Board of Trade Journal.*

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs. is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil.

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry* should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials.

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper, to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 7.] FEBRUARY 13, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Scientific Department furnishes an article on the Pollination of Coffee by bees. The only practicable method is that suggested by Mr. McCarthy, the Conservator of Forests, Western Circle, and planters are advised to fall in with his suggestions.

We give an interesting table of figures taken from the *Consular Report* showing the rapid development of German trade with India.

The proceedings of the Nilgiri and Mundakayam Planters' Associations are published. The report of the Honorary Secretary and address by the Chairman are very interesting.

The proceedings of the Mundakayam Planters' Meeting is of more general interest to the Planting Community.

We are indebted to the *India Rubber Journal* for an interesting article on "Rubber"—retrospective and prospective—and we think that all rubber planters will be glad to hear that it has been decided that this Association, should become subscribers to the Rubber Growers' Association, which will bring them more in touch with what should develop into a central authority.

We would draw attention to the notice issued by the Labour Department on the question of special expenses incurred by the Officers of the Department which cannot be charged to the general body of the subscribers to it.

A letter has reached us too late for insertion asking if any of our readers could kindly inform the writer if there are agents in India for Gordon's Pulpers, and if so, who they are. Any information on this point will be gratefully received.

About the middle of December, Mr. Brock, one of our Vice-Chairmen, accepted a Commission in the 21st Punjabis stationed at Peshawar; and only last week we saw Mr. Graham, our other Vice-Chairman, off to England on warlike thoughts intent. Writing to resign his vice-chairmanship he said :—" Allow me to wish you a most successful meeting in the monsoon. I suppose it is quite possible that we may be back in India by that time. Anyhow, I feel it is my duty to go and try and accelerate the bad time that must be coming for the German people."

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Pollination of Coffee by Bees.

My friends in the Shevaroys who have so often moved in this matter will remember that the conclusions come to by Mr. Bainbrigge Fletcher, the the Imperial Entomologist, as a result of his investigation of the subject carried out in 1913-14 were published in the *Chronicle*, Vol. IX, p. 611. Among other things he recommended that, "in districts in which destruction of these bees (*Apis dorsata*) occurs on any considerable scale it were well that the Forest Department be requested to refuse the issue of rights to collect honey and wax in forest areas except under special restrictions as regards the number of nests to be taken, or the time of year at which they may be taken."

The Board of Revenue consulted the Conservators of Forests on this recommendation and a precis of their reports with the orders of the Government thereon have been published in G. O. 3588 dated 8th December, 1914.

The only practicable method is that suggested by the Conservator of Forests, Western Circle, Mr. C. D. McCarthy which is as follows:—Mr. McCarthy says that honey and wax are collected by night by the jungle tribes for purchasers and that practically no control is or can be exercised over them. Possible expedients to achieve the end in view are reported to be to except honey of the kind in question in the sale notices, or to appoint a particular period of the year within which only the wax should be collected; to demarkate out zones around the Coffee estates near which the *Apis dorsata* is found, or to include in the sale notices descriptive lists of such zones, within which the collection of honey and wax of the species is prohibited. But all these measures would, in the Conservator's opinion, be ineffective on account of the inability of the Forest Department to enforce compliance with them. He, however, thinks that something could be done if estate managers would communicate the boundaries of the adjoining Government lands which require protection and would then assist the Forest Department to put a stop to all interference with the combs of this species of bee. The boundaries of the areas which require protection could be notified in the sale notices of the Department and the Forest Officers, aided by the estate staff, should then be able to prevent the destruction of the bee.

The Government Order on this states that the Government doubt whether any methods are likely to be efficacious, but they approve the adoption of the measures suggested by Mr. McCarthy as an experiment.

The bee referred to, *Apis dorsata*, is the large Rock Bee the only one in Mr. Fletcher's opinion which need be considered. Mr. Fletcher says that, "there is fairly definite evidence that the numbers of this bee have suffered a steady reduction in the Coffee districts of late years, and that such diminution is due to, (*a*) the reduction of suitable nesting places owing to the opening up of the Coffee districts, and (*b*) to the systematic persecution of the colonies of bees in certain districts for the sake of honey and wax. It is not practicable to take the honey without destroying the bees, but it is possible to collect the wax without injury to the bees after the latter have deserted their combs which they do at regular times of the year."

It now remains for the planters to fall in with Mr. McCarthy's suggestions, which appear to me to be very practical, and I trust that the Shevaroys, Coorg, and Mysore Planters' Associations will take steps to move in this direction.

RUDOLPH D. ANSTEAD,
Planting Expert.

GERMAN TRADE WITH INDIA.

The following figures are extracted from the latest *Consular Report* (No. 5401) and show the rapid recent development of German trade with India. In view of the present situation these figures may prove of interest to readers of the *Chronicle* and indicate the lines along which an effort must be made if at the end of the War Germany is not to resume her important position in the Indian markets :—

Product.	Imports from India into Germany.		Product.	Imports from India into Germany.	
	1912.	1913.		1912.	1913.
	Tons.	Tons.		Tons.	Tons.
Wheat ...	68,213	59,057	Gums ...	1,516	1,448
Barley ...	272,720	7,829	Rubber ...	2,093	4,200
Maize ...	12,478	1,417	Guttapercha ...	699	485
Rice ...	85,861	151,884	Raw Hides ...	732	872
Peas ...	217,385	30,963	Dry Hides ...	13,525	16,289
Rape Seed ...	100,592	116,284	Goat Skins ...	1,856	1,673
Ground Nuts ...	25,407	21,161	Horns ...	1,239	1,619
Sesame ...	19,336	31,512	Ivory ...	73	67
Linseed ...	69,285	68,079	Rice ...	248,681	212,017
Soya Beans ...	26,163	25,255	Starch ...	1,972	2,279
Copra ...	37,136	52,539	Rice Waste ...	89,276	105,046
Cotton ...	37,771	56,598	Oil Cakes ...	32,771	31,906
Waste Cotton ...	6,211	6,085	Manganese Ore ...	124,588	174,696
Jute ...	155,369	155,921	Wolfram Ore ...	459	971
Fibres ...	2,778	3,991	Indigo ...	32	23
Tea ...	543	587	Bone Meal ...	14,053	12,451
Pepper ...	1,319	1,564	Coconut Yarn ...	8,997	8,804
Cinnamon ...	44	52	Jute cloth ...	2,117	2,029
Timber ...	5,869	5,770	Sheep skins ...	403	345
Myrobalams ...	9,838	11,341	Goat skins ...	975 lbs.	915 lbs.
Cutch ...	1,109	2,107	Pearls ...	269 tons.	314 tons.
			Tin ...	1,365	927

In return for this Germany exported to India in 1912 and 1913 the following:—

Products.	Exports from Germany to India.		Products.	Exports from Germany to India.	
	1912.	1913.		1912.	1913.
	Tons.	Tons.		Tons.	Tons.
Beet Sugar ...	...	4,113	Iron Sections ...	33,403	98,675
Spirits ...	682	874	Thin Sheet Iron...	5,027	12,392
Beer ...	5,121	5,184	Thick „ „ ...	16,521	19,413
Condensed Milk...	393	1,353	Iron Pipes ...	25	2,425
Cement ...	13,150	22,118	Railway Rails ...	7,436	13,983
Coal ...	3,717	42,704	„ Axils &c..	4,041	9,139
Mineral Oils ...	5,045	7,213	Iron goods ...	2,020	3,313
Sulphate of ammonia ...	42	804	Wire Tacks ...	2,525	3,971
Analine Dyes ...	2,848	2,404	Household Utensils ...	655	748
Synthetic Indigo...	376	319	Locks ...	1,136	1,565
Clothing material..	1,240	1,286	Knives ...	400	567
Cotton Goods ...	4,545	6,947	Umbrellas ...	1,579	1,901
Gilt Mouldings ...	776	776	Copper bars ...	132	944
Coloured Glass ...	2,587	2,586	Brass bars ...	6,509	10,758
White Glass ...	557	823	Electrical machinery ...	58	539
Lamp Glasses ...	1,065	1,403	Toys ...	740	896
Iron Bars ...	17,906	18,721			

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

The Annual General Meeting of the Nilgiri Planters' Association was held in the Collector's Office, Ootacamund, at 11-45 a. m., on Wednesday, the 20th January, 1915.

PRESENT.—Messrs. J. S. Nicolls, (Chairman) ; The Hon'ble E. F, Barber, J. E. Bisset, E. S. Clarke, I. Stewart, W. A. Cherry, J. H. Pascoe, C. W. Deane, A. R. Piggot, A. S. Dandison, L. A. G. Rogers and G. W. Church (Hon. Secretary).

Visitor.—Mr. Loveluck (Dist. Supt. of Police.)

136. The proceedings of the last meeting were taken as read.

137. The following report was read by the Hony. Secretary ;—

" Mr. Chairman and Gentlemen,—*Acreage.*—I am very glad to be able to give you a very satisfactory report of the finances of this Association during 1914. During the past year 5 new estates representing an acreage of 5.118 joined the Association and for the present year 3 estates representing 380 acres have not rejoined. The total acreage subscribing in 1914 was 17,134 against 12,725 for 1913, and the acreage for 1915 as far as I have been able to discover hitherto is 17,398, an increase of 264 over 1914.

Balances.—In the matter of finance, we have no debts outstanding but have a cash balance of Rs. 100-1-6, and a bank balance of Rs. 902-13-0, total Rs. 1,002-14-6 from which must be deducted the last quarter of 1914's subscription to the U. P. A. S. I., namely, Rs. 535-7-0. This leaves a nett balance of Rs. 467-7-6. Altogether I think we may say the financial position of this Association is very sound, and thanks for that is very largely due to my predecessor, Mr. Nicolls, who, when he resigned office, showed a very considerable balance in the Asssociation's favour. He also during the past year saved the Association money by waiving his right to the allowance that is made for a clerk.

War Fund.—The members of this Association with one or two people outside the Association gave Rs.1,653 to the Imperial Indian Relief Fund and 8,250 lbs. of tea to the Hospital Ship ' Madras' and to the Indian Expeditionary Force. I have also been promised 1,616 lbs. of Coffee for the troops.

Labour Department.—It is probably outside the scope of my work to comment on the number of members who joined the Labour Department. However, this has been supported with 11,069 acres in our Association which is not a bad percentage of our total acreage. I know I have worried a few members to a considerable degree over this matter and I had a lot of trouble to get accurate figures from some members. I hope they will pardon my insistence but I would ask all members, as they have been asked in years past by former Honorary Secretaries, to remember that the lot of the Honorary Secretary is not all jam. The Honorary Secretary has an appreciable amount of work to do in return for which he sometimes receives inaccurate answers, or no answers at all. To the vast majority of members of this Association I should like to tender my hearty thanks for the way in which they have answered questions accurately and what is equally imoprtatn

quickly. I ask all members to be good enough to send replies accurately and quickly. If they will do this it will save a lot of trouble.

Attendance.—The average attendance during 1914 was 15, which gives a very poor percentage of attendance considering there are some 55 members in this Association; especially is this so when one remembers the importance of the labour questions which occupied our attention during the larger portion of the year.

I think I have said all that is necessary. I only hope that members will try to show their interest in planting and in their Association during 1915 by attending meetings and by giving the Association the benefit of their opinions. It only remains for me now to ask to be allowed to place my resignation in your hands.

G. W. CHURCH,
Hony. Secy., N. P. A.

The Chairman next made the following remarks: –

"Gentlemen:—You have heard the Honorary Secretary's report and thanks are due him for the way he has so carefully looked after your interests. Owing to the great distance we live from each other, I was unable to be as much help to him as I hoped. I think it would be advisable in future to elect as Chairman and Honorary Secretary two men who can if necessary meet easily to discuss important matters. For myself I thank him for the courtsey he has always shown me.

Our industry, at least the financial part of it, at one time looked to be under a cloud—but I am glad to say it has lifted. Mr. Richardson, the Chairman of the U. P. A. S. I., called a Finance meeting in Madras which Mr. Brock and myself attended. The thanks of the planting community are due to the Banks and Agents for the ready way they were prepared to help us.

Scientific Department.—Commencing with the Chairman's speech at your last Annual Meeting, there seemed every possibility before the end of 1914 of this Department developing into one that would be of the greatest advantage to us and at the Annual Meeting of the U. P. A. S. I. held at Bangalore in July, it considerably materialized, but still we are without what is an absolute necessity to us, *viz*: an experimental plot at the Scientific Officer's door on which he can see his ideas developing, the results of which would be practical illustrations to us. I am of opinion that such a plot should not solely contain our various products at their best or even growing under the best conditions of soil and climate. Many of us want to know how to make good out of bad and it is the sick that want most attention. Gentlemen, I believe in a Scientific Department. Essays on manures and cutting from newspapers are both useful, but you want more and I sincerely hope that the Madras Government will eventually run our Scientific Department for us, and in doing so I feel we shall be getting most of what we want.

Labour Department.—This is now in its early days and you cannot expect everything you want by return of post. But it will eventually, I feel confident, give you the benefits I have always predicted. If not I shall hide myself. You will have to decide amongst yourselves as to whether this Association shall consider local rules, and appointing a Committee of reference. The Director of the Labour Department has circulated amongst members of the Department some "Suggested Rules" and I think it would be to your

mutual advantages if all members of this Association, irrespective of their being members of the Department or not, agreed to abide by a set of rules workable under Act I of 1903.

Gentlemen, there is nothing more to say, but to thank all those who have attended meetings and for the courtesy they have always shown me. I should have liked to see the meetings better attended. I am a busy man and if I have in any way failed in my duties to you, I hope you will forgive me.

J. S. NICOLLS,
Chairman.

A vote of thanks to the Chairman and the Honorary Secretary was proposed by Mr. Pascoe and seconded by Mr. Cherry.

138. Mr. Nicholson's letter.—This was read and the meeting was of opinion that his request was impracticable.

139. U. P. A. S. I. Circulars of the 17th November and 22nd December were read and recorded.

The meeting voted that the circular with regard to Scientific Officer's Department should be printed and sent to all members of the Association.

140. The District Police Superintendent's letter with regard to coolies bringing cash from Ootacamund.—This letter was read and the Chairman thanked Mr. Loveluck for so kindly bringing the matter up before the Association and coming forward in order to help the interests of Planters. The Chairman thought they should avail themselves of the offer and so help in the prevention of crime. The Honorary Secretary was directed to have the letter printed and circulated.

141. District Superintendent's letter *re* policing coffee.—This was read and recorded. If any members of the Association have any suggestions to make with regard to the methods and areas of policing coffee, Mr. Loveluck will be very pleased to receive their suggestions.

142. *Tea Freight.*—The letter from the Secretary of the U. P. A. S. I. on this matter was read and recorded

143. *Supply and Transport.*—Tea and Coffee contracts.—The conditions under which these contracts might be entered into were placed before the meeting.

144. *Election of Office Bearers.*—The ballotting for office bearers resulted in the following members being elected to various offices.

Chairman.—Hon'ble Mr. E. F. Barber.

Vice-Chairman.—Mr. J. S. Nicolls.

Committee.—Messrs. J. H. Pascoe, C. W. Deane, J. H. Wapshare, A. S. Dandison, E. S. Clarke and J. E. Bisset.

Honorary Secretary.—Mr. L. A. G. Rogers.

With a vote of thanks to the Collector for the use of the room the meeting terminated.

G. W. CHURCH,
Honorary Secretary.

Mundakayam Planters' Association.

Proceedings of the Annual General Meeting held at the Mundakayam Club, on Saturday, 16th January, 1915 at 10 a.m.

PRESENT.—Messrs. H. B. Kirk (Chairman), R. Harley, J. J. Murphy, A. Hamond, E. Hall, T. H. Fitchett, M. H. Byfield, N. B. Hartley, R. J. Scarbrough, D. U. Somers, A. Pollock, J. Wedderspoon, J. H. B. Sullivan, F. Simmons, G. West (Hony. Secretary) and by *Proxy*.—Messrs. W. O. Asher and J. R. Vincent.

On rising, the Chairman stated :—

" Before commencing the business of this Meeting, I regret that we have to record the sad loss of two members of our Association and one other European in this District. Mr. Yeates of Kadamankulam Estate, and Mr. H. Lord, of Boyce Estate and Mr. F. G. Richardson. I will ask you now to pass a vote of condolence to their relatives, in the usual way, in silence and standing. I will ask our present Honorary Secretary to communicate this vote of condolence to Mr. E. Lord, and through Mr. Leahy, and I will take it upon myself as one of the two men present who knew Mrs. Richardson to write to her."

The vote was passed : all members standing

Minutes.—The Minutes of previous Meetings were confirmed.

The Honorary Secretary's Report.—The Honorary Secretary said :

" Mr. Chairman & Gentlemen,—As most of you are aware I have the honour to submit the Secretarial report for the past year on account of my predecesssor Mr. Milbank, having had to proceed Home in August to join his Regiment as a result of the present War in Europe. If therefore my report shall in any way be deficient or otherwise imperfect, I crave your indulgence. The Chairman to whom I am much indebted for assistance, however, will doubtless make up for any of my omissions.

All the subscriptions to the Association for the past year have been paid and the sum of Rs. 130 has been contributed to the Lady Ampthill Nursing Institute by various members, but this sum might be considerably augmented by additional subscriptions and opportunity will be afforded at this Meeting for members intimating subscriptions for the current year. A sum of Rs. 225 has been contributed by Members to the Planters' Benevolent Fund, but this laudable scheme deserves still more support. Referring further to matters financial which will be more fully dealt with by the Auditor in his report, I may point out that in the early part of the year a sum of Rs. 2,500 has been contributed by the Association towards the erection of the fine building in which we are now met.

I find that the acreage under cultivation in the District at the end of 1914 was 11,817·11 acres under Rubber, 855·36 acres under Tea and 45 acres under Rubber and Tea interplanted, making a grand total of 12,717·47 acres. This is an increase of 36 acres over the preceding year.

Throughout the year there have been 5 General Meetings of the Association and 5 Committee Meetings and the attendance of members indicated a continued interest in Association matters. Although it was a matter not directly concerning the Association, I, in the position of Secretary have, as you are aware, circularised members in connection with the collection of contributions to the various War Funds and a very gratifying response was made to my appeals, a sum of Rs.1,883-9-0 having been

contributed to date. In this connection I am pleased to say that this sum is made up of contributions not only from Managers and Superintendents but also from the Native Staffs and coolies of the various Estates in the District.

Kodimatha Landing Stage.—At last the Government have moved in this matter and have intimated to me that Government have sanctioned a grant of Rs.10,100 towards the erection of this landing stage and Government hope that the necessary work will be completed before next monsoon. Mr. Richardson has been indefatigable in his efforts to procure this improvement.

Labour Commission.—Last year saw the consumation of the Labour Commission of the U. P. A. S. I., but in spite of eloquent appeals made by at least one member of this Association, we did not see our way to support the scheme. An effort was made to establish a local Labour Commission, but nothing came of this as the scheme was not supported by the other local Associations.

Cattle Pound.—We were ably represented at the last session of the Sri Mulam Popular Assembly at Trivandrum by Mr. Edwin Vincent who represented to His Highness' Government the question of Grazing Land and the stray Cattle nuisance. Nothing further, however, has been done so far in this connection, and the matter is again to be brought before the Assembly this year by our Delegate, Mr. Hamond.

U. P. A. S. I.—Our Chairman, Mr. Kirk, attended the Annual General Meeting of the United Association at Bangalore and you will all have read his comprehensive report in the *Planters' Chronicle.*

Scientific Officer's Department.—An arrangement was come to for the handing over of the Scientific Officer's Department to the Madras Government on the condition that the U. P. A. S. I. should contribute the sum of Rs.15,000 for 5 years and the Government themselves contributing Rs. 30,000 a year. This scheme, however, has not been carried through as the Government wisely did not feel prepared under the conditions imposed upon them by the European War to launch out into any new expenditure. This matter is now in abeyance.

As you are all aware, the effects of the crisis which at present convulses Europe were felt even by us in this distant part of His Majesty's Dominions. At the outbreak of the War, there was a tendency in this District to the raising of prices of foodstuffs by local tradesmen, but your Committee took prompt steps to prevent this and had the co-operation of the Deviculam Superintendent, Mr. Robinson, with the result that there was little or no artificial rise in the price of food.

Before sitting down, I wish also to place upon record my sense of regret at the lamented deaths of two of our members, Mr. Yeates and Mr. Lord.

I likewise wish to thank the members of Committee and the Association generally for the support they have given me during my short tenure of office.

I would again ask you to deal leniently with my omissions, and I now beg to place my resignation in your hands."

This was adopted and a vote of thanks to the Honorary Secretary proposed by the Chairman and seconded by Mr. Murphy was passed.

Chairman's Address.—Mr. H. B. Kirk said :—

"Gentlemen,—I trust that you will consider that throughout the year the affairs of the Association have been efficiently carried out, and this is

entirely due to the energy and ability of our Honorary Secretary, and the generous help the Committee have given. The abnormal circumstances have necessitated numerous Committee Meetings, at all of which the attendance has been gratifying. As regards the position of Rubber, in August when the War broke out, 1st Quality Plantation Crepe was sold at 1*s.* 7*d.* a lb., on the London market. On the Colombo market, No. 1 Biscuits which were realising 2*s.* 2*d.* a lb. in July, on August 10th went for the ridiculous figure of 8½*d.* a lb., less than one-third of the price of a month before. The market has now practically recovered its ante War position, and good quality crepes are now fetching over 2*s.* a lb., although the Colombo has not recovered with the same buoyancy as the London market.

A Director of several Rubber Companies whose opinion is highly esteemed wrote at the end of August. "Are Plantation Companies wise in now making forward contracts at current prices for delivery of Rubber during 1915. I am of the opinion that the usages of the rubber in modern warfare are so colossal—I can use no other word—, that when the War is ended there may well be a considerable shortage of rubber. I am, for the above, and other obvious reasons, strongly opposed to the principle of Plantation Companies selling forward for 1915. I think they will get better prices for spot in the near future."

At home the Rubber Manufacturers are very busy. I look with some apprehension at the present heavy accumulation of rubber stocks owing to the prohibition of all exports to neutral countries from London. I trust, however, that the recent steps taken by the authorities to allow export of crude rubber to America, with the proviso that the manufactured articles shall only be re-exported from America *via* London will relieve the congestion. I feel sure that every Englishman present would rather sell his rubber at a loss than have one lb. of it go to Germany or Austria.

I think we have every reason to be proud of the fact that ten of our able bodied young men out of our Planting Community of 33 have already gone on service, and out of the 23 remaining to supervise this Rubber District, seven are over the age limit. Mundakayam has sent 40% of age limit men, and it would be interesting if the Editor of the *Planters' Chronicle* would collate statistics from other Districts. As for the elder men who are in responsible positions and who are allowing their Assistants to go while they carry on the extra work entailed, of them it may be said "They also serve." I have pleasure in laying an appeal for men from the Legion of Frontiersmen on the table and trust it may receive your support, and if you cannot go yourself pay for one man's kit.

The Motor Lorry service inaugurated in 1913 has worked efficiently during the past year, and been of great service to the District.

Labour conditions have been favourable during the year. Your Honorary Secretary will, I hope, give you figures *re.* yields etc.

In retiring from the Chair, I thank all present for the support they have given me, and I regret that I am unable to accept any office on the Committee during the coming year, so in filling up your voting papers, kindly eliminate me entirely. As a member only I will help the Association in any way I can in 1915.

In conclusion, I must again, even at the expense of being considered redundant, thank our Honorary Secretary, Mr. George West, who has worked so hard for our Association."

On the proposal of Mr. Murphy, a hearty vote of thanks was accorded to Mr. Kirk.

Auditor's Report.—Mr. M. H. Byfield reported as follows :—

Mr. Chairman and Gentlemen,—On the 13th of January, 1915 the accounts of the Association were audited and found correct. The Balance Sheet was duly signed by the Honorary Secretary. The accounts are correct by the Bank Certificate of Balance.

The total amount of the funds in the Bank to the credit of the Association at the 31st December, 1914 is Rs.353-11-1. Included in this is the sum of Rs.255 to be paid to the Planters' Benevolent Fund and the sum of Rs.130 to the Lady Ampthill Nursing Institute, After deducting these amounts the credit Balance stand at Rs.168-11-1. There is also Rs.29-11-0 in cash in the hands of the Secretary making a total of Rs.198-6-1.

The only debit on the Balance Sheet is Rs.37 on cattle pound account which I understand was paid out by Mr. Harley for work done and was refunded by the Association.

The following figures show the total amount of Revenue and Expenditure during the year:—

Receipts.	Rs.	A.	P.	*Expenditure.*	Rs.	A.	P.
Balance carried forward from last year...	1,712	14	4	Expenditure for the year ...	5,081	14	8
Receipts for the year ...	3,604	6	5	Paid to Mundakayam Magistrate — War Fund a/c. ...	1,883	9	0
War Fund Account ...	1,883	9	0	Balance carried to 1915 ...	235	6	1
Rs...	7,200	13	9	Rs...	7,200	13	9

This was adopted on the proposal of Mr. Murphy seconded by Mr. Hall.

Mundakayam Police.—Mr. Harley gave details of cases in which he found great difficulty in getting the attendance of the Police. He stated that it took 33 hours for a constable to arrive at Manikal Factory from Mundakayam and further said that, in his opinion, the local police were absolutely inefficient. Mr. Harley then read to the meeting a letter which he had written to the Commissioner of Police in regard to this matter and a Resolution was unanimouly passed strongly supporting Mr. Harley's position.

Roads and Drains.—Mr. Murphy proposed (1) "That Government be thanked for having agreed to make the required improvements to the Kanjirapally-Errattupettah road and that this Association regrets that nothing has so far been done." (2) "That the attention of the Government be also invited to the state of Errattupettah-Meenachal road" and (3)" That Government be asked to upkeep the Kutikal-Yendayar cart road and to build a bridge over the Talungal river at Kutikal." Mr. Harley seconded these Resolutions and they were unanimously carried.

Mr. Murphy explained that the Yendayar cart road was made some years ago by Yendayar Estate and had since been kept in good order by that Estate, and now that all the land on both sides of the road between Kutikal

and Yendayar is being cultivated and houses are being built, it is only reasonable that Government should undertake the upkeep. The bridge over the Talungal River will be of benefit to Kutikal villagers as well as to people using the cart road.

U. P. A. S. I. Labour Department.—Mr. Murphy moved "That this Association trusts that there is no truth in the rumour current in the District that Managers of Estates subscribing to the U. P. A. S. I. Labour Department have been asked to supply the Department with as much information as possible concerning Labour employed on non-subscribing Estates." This was seconded by Mr. Hamond and carried unanimously.

Notice of the following Resolution to be put to next Meeting was given by Mr. Murphy:—

"That in the event of the Labour Department not being entirely disassociated from the U. P. A. S. I the Mundakayam Planters' Association will withdraw from the U. P. A. S. I."

Annual Subscription.—It was decided on the proposal of Mr. Murphy seconded by Mr. Harley that the subscription of the previous year, *viz.*, 3 annas per acre, remain the same.

Election of Office Bearers for 1915.—The following Office Bearers were elected:

Chairman	...Mr. J. J. Murphy.
Vice-Chairman	...Mr. Ashton Hamond.
Honorary Secretary ...	...Mr. George West.

Committee:—Messrs. R. Harley, J. R. Vincent, H. M. E. Howson, and G. H. Danvers-Davy.

A vote of thanks to the retiring Chairman proposed by Mr. Murphy was heartily responded to and with this the Meeting terminated.

(Signed) H. B. KIRK,
Chairman.

(„) GEORGE WEST,
Hony. Secretary.

STRAITS SETTLEMENTS.

Rubber Exports during November, 1914.

The following figures of the exports of cultivated rubber from the Straits Settlements during the month of November, 1914, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for November, 1913, being added for purposes of comparison:—

	1913.	1914.
	Tons.	Tons.
November ...	1,223	2,370
January—November ...	10,672	17,393

These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, Sumatra and the Non-Federated Malay States, but do not include rubber exports from the Federated Malay States.—*The Board of Trade Journal.*

RUBBER.

Retrospect and Prospect.

Plantation Features.

It cannot be said that the year under review has been very eventful so far as new methods of tapping, preparation, plant sanitation, and other principal works are concerned.

The Standardisation Committee of the R. G. A. issued a printed series of instructions regarding essential points to be observed in connection with collecting, coagulating, machinery, drying and smoking of rubber, the object being to achieve greater uniformity in the finished product. If one may judge from the samples displayed on the London broker's counters there is still an enormus variation in actual quality, which is only partially reflected in valuations. It seems a hopeless task to secure uniformity on the estates and we must confess to a conviction that it is, either practically or scientifically, impossible. We are of the opinion that though variation will tend to diminish as years roll by, it will never be eliminated ; in the immediate future and probably for all time prices will not be in accordance with quality. A scheme whereby values could be determined to the mutual satisfaction of producers and manufacturers was put forward during the year, but was too much for many practical plantation directors. In fact directors of some standing have been heard to deny the existence of extensive variability in plantation rubber, their position being that they knew of manufacturers who assured them their rubber was all right ! Why should directors do more than sell their rubber at a profit ? Why should they go to the trouble of having indices of value determined for their lots of first quality plantation when they can sell it forward in any quantity ? The fact is directors of old plantation companies have, in many instances had too easy a time, and large profits have been made with very little effort. When profit depends upon a farthing per lb. they will perhaps see the advisability of determining the real value of their consignments before accepting bids. In our opinion the attitude of many plantation directors on standardization during the year has been deplorable ; they have declined the assistance of manufacturers of high repute, and have entirely failed to grasp the basis of the schemes presented to them in the Press.

Collecting Operations.

Tapping knives and systems have not shown any considerable change. The majority of the old types are still in existence, there having been no new knives launched ; in fact it has become almost impossible to invent a new system of tapping. The use of sodium sulphite in collecting cups, for keeping latex liquid, has become frequent. There has been a slight change in frequency of tapping, hastened somewhat by the adverse labour conditions prevailing ; the tendency has been to increase the interval between successive tapping operations. We published in Our Special October issue the results of expeiments made by Mr. Bosanquet on a Java estate which confirm some of the earlier results of Mr. Sydney Morgan in Malaya. We do not, however, expect a rapid change in this direction until planters and directors have found that the primary and renewed barks have been used up in securing latex containing very little rubber. The finest way in which this can be brought home to planters is to actually measure the percentage of rubber in the latex daily throughout the year; this observation, if carefully done and recorded, will show that daily tapping does not give, in general, the best results for the quantity of bark used up.

Information of this character would enable directors to see how the asset of the company—living bark—can best be tapped.

Without wishing to appear stubborn, we can say that after another year's work we are still of the opinion that, within limits, the longer the interval between successive tapping operations, the greater the distance between, and the shorter the length of tapping lines, the greater will be the total yield of rubber and the better the health of the tree. Long association with tapping work is apt to lead one to overlook the fact that tapping is sheer amputation and absolute destruction of living material of vital importance to the plant. Conservation of living bark is the finest testimoney of a rubber planter's work.

Coagulating and Machinery Changes.

There are one or two features in those departments of estate work which are worthy of notice. In the first place the supply of acetic acid, which was at one time seriously thought to be capable of curtailment in consequence of the war, has been steadily maintained in gradually increasing quantities throughout the year. Ultimately, should no better coagulant be brought forward, we look to the supply for estate purposes being at least quadrupled. The war has opened out a prospect for bigger business in the manufacture of this reagent in this country.

On the estates the amount used per pound of rubber prepared has probably diminished. The instructions previously referred to in connection with the Standardization Committee suggested the use of stock solutions on all estates; this will undoubtedly result in economy and in better rubber being prepared. Together with the use of a lactometer or metrolac instrument, the use of stock solutions of known composition should have permanent and beneficial results.

Bulking of latex and the use of large coagulating troughs provided with partitions for facilitating the manufacture of sheet rubber, are also improvements which have received active attention during the year. We have seen various designs of coagulating tanks, manufactured in the East and in this country, and fully expect that the firms who have previously dealt with the machinery for estates will perfect coagulating tanks of various capacities. The use tends to eliminate variability, especially when their capacities are large and the latex is properly mixed before and after the coagulant is added. They should be capable of being easily cleaned and provided with means whereby the phases of coagulation can be easily observed.

The milling plant has undergone a little change in so far that renewals of crepeing and macerating machines have usually been of larger types, especially on large and old estates. We cannot say there has been much change in the tearing capacity of the crepers generally; in the total plantation rubber has probably been less torn because so much has been turned out as smoked sheet.

During the year a new idea with reference to the diamond pattern on smoked sheet was put before us. Ordinarily each roller is cut into diamond patterns; this means heavy expense and so much good, hard, chilled cast iron destroyed. Instead of having the complete diamond patterns cut on each roller, it was suggested that if each roller was spirally cut in opposite directions the grooves on opposite rollers would cut across one another in such a manner as to leave a perfect diamond pattern on the rubber. We were given the name of the estate where the rollers were said to be working, but cannot give any definite recommendations until we hear from the machinery firms concerned.

Drying and Smoking.

Without wishing to discourage those dealing with new or old inventions we think we are correct in stating that none of the patent drying and smoking processes of recent origin have been extensively adopted during the year. This does not necessarily mean that some of the processes are not sound; it may mean that planters and directors are frequently only too satisfied to continue on old lines which have been proved to be economical and serviceable. While we agree that it is not advisable to change estate methods too frequently, we cannot agree that the mechanical side of estate work is anything like perfect. Experience has demonstrated how planters in some colonies are opposed to the adoption of apparatus and and methods eminently successful in other but near colonies; these phases are but "milestones" in the early history of rubber preparation under European control. Our view is that the estate methods adopted in the curing and smoking of planting rubber, in the grading of cured stuff on appearance only is absurdly primitive; the former methods are risky and also mostly costly from a labour point of view, and the latter is only on a part with the crude basis of valuation in this countray. Furthermore the danger attached to the present smoking and curing mothods are reflected in the enormous rise in rates for insuring rubber while in the factory and smoke house. We do not deem it advisable to publish the information we possess on this subject, but feel justified in appealing to all machinery firms and planters of an inventive frame of mind for some special effort to place this department on a safer and more modern basis. There is a magnificent opening in this direction.

General Cultivation Changes.

Beyond the few experiments in new or patent weed killers, the use of disc harrows on flat land free from tree stumps, and the more frequent use of tree stump extractors to prevent the spreading of diseases, there has not been much to report. Owing to the advanced average age of rubber clearing there has probably been more extensive destruction of Hevea trees in the operation of thinning-out than in any previous year. The general view is that the average maximum number of Hevea trees should not exceed one hundred per acre; on poor or hilly ground more are permitted, while on rich flat land eighty trees per acre is probably ample. Manuring has not been very extensively done, though forking and chankolly-ing, with or without liming, is frequently practised. We do not believe that artificial manuring on Malayan and Sumatran Hevea estates will ever reach the standard it has attained on Ceylon tea estates; neither do we believe it is warranted with a forest type of cultivation. In our special October issue it was shown publicly for the first time that the cost of manuring in Ceylon brought the total expenditure on Hevea estates in that island to a very high figure compared with Malaya. The statistics, compiled by Mr. H. K. Rutherford, created a little stir at the time; but they have not been challenged and may therefore be taken as correct.

Diseases and pests have not shown any startling propensities during the year: "dieback," bark canker, pink disease, Fomes and white ants are still the biggest offenders, and will probably always be with us. It is known that the war led many managers to curtail their expenditure on diseases and pests; this is bad policy, and will be as detrimental as the removal of estate doctors. Plant sanitation requires, like all other diseases, constant and improving attendance; laxity in this direction will lead to epidemics among the weaker plants.

Extensions During 1914.

The low prices ruling for plantation grades throughout the year, the absence of surplus cash in the coffers of most plantation companies, and the necessity of effecting extensive thinning-out operations have prevented most managers from very seriously extending their planted acreages during 1914. Where extensions have taken place they have been at wide distances; 20 by 20 feet appears to be the minimum spacing, whilst 35 by 30 feet is near the maximum, the latter having been adopted where intercrops of coffee were to be planted. The comparative inactivity of planting work during the last two years will tend to prevent big annual increases in crops during 1919 and 1920.

Estimate of Planted Acreages.

During 1914 one heard more of small areas being abandoned than of new blocks being planted. We do not think the total planted acreage has been much increased during the year, except in parts of Sumatra and Malaya. Our estimate of planted acreages as at the end of 1914 is as follows:—

	Acres.
British Malaya and Native States ...	610,000
Ceylon and South India	280,000
Java	250,000
Sumatra and Borneo	265,000
Cochin China	30,000
African Plantations	50,000

The two last-mentioned areas are likely to show big reductions, especially the Ceara plantations in Africa. There are, of course, additional acreages in Samoa, Fiji, Rapua, Seychelles, and also in parts of Brazil.

Further evidence has been received during the year of the unsatisfactory returns from every species under cultivation except Hevea,—*The India-Rubber Journal.*

Preserving Cut Flowers.

Reports have been made in these pages of methods which claim to prolong the life of cut flowers. The methods consist in the addition of various salts to the water in which the stalks are placed. Comprehensive experiments carried out by Professors B. M. Digger and Lewis Knudson at Cornell show, however, that little, if any, effect is produced by such additions of salts. The trials were made with Cosmos, Petunia, Aster, Verbena, Violet, Coreopsis, Dahlia, Tagetes erecta and T. patula, Geranium, Zinnia, Sweet Peas, and Pansies. Many different solutions were tried, including those of calcium nitrate, zinc sulphate, copper sulphate and common salt. Mixtures of salts were also employed. In no case was any striking result obtained, though not infrequently the treated flowers kept a day or so longer than those put into plain water. The fouling of water due to bacterial action which takes place when certain cut flowers are kept in water, may be prevented by the addition of a *trace* of zinc sulphate or copper sulphate. Boiling, burning, or mashing the cut ends of the stems—processes which are often recommended—proved useless, but the daily removal of the cut end—as is so commonly practised—was found to prolong the life of the flower. —*The Gardeners' Chronicle.*

LABOUR DEPARTMENT.

Notice is given that all objects of the Department will be carried out without further expense to Subscribers than the subscription of Rs. 2 per acre per annum. Special expenses incurred on behalf of individual Estates, which cannot properly be charged to the general body of subscribers, will however have to be paid by the Estates concerned, such as legal expenses (Vakil's fees, Court fees, witnesses batta, maintenance of civil debtors in jail, etc). Special visits to Estates made by Officers of the Department at the request of those Estates, travelling expenses of officers and Agents outside the area covered by the Department's operations, such as chasing defaulters in countries oversea, or in territory beyond the limits shown to the representatives of Subscribers when the starting of the Department was under consideration. For such and any other special expenses, the Estates concerned will be asked to put Officers of the Department in funds to meet them.

AYLMER Ff. MARTIN,
Director.

Bangalore, 6th February, 1915.

HANKOW.

Tea.—The tea season of 1913 showed that the record crop of 1913 had over-stocked the market in Europe, for there was but a short crop, particularly in common teas. The native producer appears to have anticipated this condition of affairs, and to have arranged his crop accordingly. Not so the middleman—so important a factor in this and other Chinese trade—many middlemen speculated on a large scale and lost considerably thereby.

Of the common teas Russian merchants bought a larger quantity than in 1912, but taken as a whole some 20 to 25 per cent less tea was bought for Europe and America than was the case the preceding year. Prices were low, on account of the aforementioned condition of the market, but growers have really been exerting themselves to grow a better quality of tea, a very gratifying sign of the times, having as a result the production of a more satisfactory article than before.

China tea has a poor sale in Europe compared with that of India and Ceylon; were it not for this, there would be a very fine field for speculative purchasers.

Shares in Indian and Ceylon tea gardens are generally on the market at home, while those in Chinese tea gardens are not; it thus happens that blenders who can find suitable varieties for their purpose in the India and Ceylon product will prefer to use these, at the same time investing in them and thus securing a double interest in the tea.

A certain feeling of annoyance among exporters has been caused by the high freight rates charged by shipping firms—being about 50 per cent. above the usual Yangtse rate. This is explained by the entry of the Nisshin Kisen Kaisha into the pool, thus removing the fear of a rate war, and allowing exultant shipowners to recoup themselves for the scanty profits of recent years. This—from their point of view—felicitous state of affairs is, however, not likely to be of long duration, as the East Asiatic Company (Danish) and the Rickmers Company (German) are about to start a service from Hankow direct to Europe, which, owing to the lower rates charged, will undoubtedly remove a great deal of the export trade from the pool companies, notably in tea and sesamum.—*Diplomatic & Consular Reports.—China.*

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c, and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil.

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry* should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper, to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 8.] FEBRUARY 20, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department provides us with some notes on "Bone Disintegrators" extracted from a leaflet published by Mr. R. Cecil Wood, the Principal of the Coimbatore Agricultural College. The hints given as to the purchasing of an engine of not more than 5 horse power is worth considering by those who can purchase bones in bulk.

Catch crops with rubber finds a place taken from the *Tropical Agriculturist* by a Travancore planter. This subject has been much discussed in this paper.

The Proceedings of a well-attended meeting of the South Travancore Planters' Association are published.

From *Grenier's Rubber News* we extract an interesting article entitled "How long will the War last?" It gives the extent of territories now engaged in the war; then the population of the various countries engaged. The enormous expense entailed is almost beyond belief, but as was said however long the war lasts, the country that can put up the last million will win.

If it is true that Vodka as claimed by a Russian Professor has been found to be the basis of the production of synthetic rubber, the question of synthetic rubber would be solved. But has it been?

We publish a review of Mr. Anstead's Bulletin on "Coffee, its cultivation and manuring in South India," published by the Agricultural Department of the Mysore State, by Doctor Leslie Coleman. This Bulletin can be purchased, as Mr. Montague Twigg said, for the ridiculously small sum of two pence or two annas. Primarily published for the native coffee planters of Mysore, it will interest all European coffee planters.

From the *Hawaiian Forester and Agriculturist* we publish an article on "Rubber—its new uses," which are varied. A small para. from *Capital* supplies us with a note on the prohibition of the export of tea to all Continental countries except the Allies, Spain and Portugal, and from *Tropical Life* we publish some startling figures showing the export of tea from Holland to Germany in the years 1913 and 1914.

SCIENTIFIC DEPARTMENT. U. P. A. S. I.

Bone Disintegrators.

The U. P. A. S. I. have constantly maintained that everything possible should be done to reduce the extensive export of Bones from India and to popularise this form of fertiliser with the ryots. The following leaflet (No. 8 of 1914) compiled by Mr. R. Cecil Wood, the Principal of the Coimbatore Agricultural College, has been issued under the title of "A Note on a possible use for Oil Engines when not required for Pumping." This leaflet contains an eminently practical suggestion which it is to be hoped will be adopted in many places. The leaflet is as follows :—

"The very large export of bones from the Presidency is taking away from the land an important plant food, and one which experiment has shown is of great benefit to many crops. Further information about the value of bones as a manure is given in the bulletin on paddy manuring issued by the Agricultural Department and published at 3 pies. But for bones to be useful as a manure they require to be finely ground before being applied to the fields, otherwise their action will be very slow. This grinding is done by machinery, and it is suggested that owners of oil engines and pumps might find it profitable to use such machines, to give work for their engines, at the time when there is no pumping work to be done. The bones can be easily stored, both in the raw state and after crushing, as bone-meal, so that the work can be taken up intermittently, whenever opportunity occurs.

"A trial has been made with a small machine at the College Farm, Coimbatore. The machine was supplied by the kindness of Messrs. Burn and Co., and is a Christy and Norris Disintegrator size 00 : it is priced at Rs.340. This disintegrator consists of a shaft carrying four strong iron bars, which revolves at a very high speed, 4,400 revolutions per minute, inside a strong iron casing and beats any material introduced therein until it is fine enough to pass out through the sieves provided. These are of several different grades, so that the degree of fineness to which the material can be ground, can be varied.

"A trial made with ordinary bones, with a sieve of 3 16" width, showed that a ton of bones could easily be crushed in a working day of 8½ hours. Bone-meal is now selling at from Rs80 to 85 a ton according to the fineness to which it is ground : if the price at which raw bones can be purchased is known, it can easily be calculated whether it would be profitable to buy a machine or not. The engine power required to run the machine is not more than 5 horsepower. Other materials besides the bones can be crushed in the disintegrator. It has been used e.g., to grind up bricks, which it will do at about the same rate. Any bark or root which has to be ground, may be treated in the same way.

"The Department of Industries, Madras, is prepared to give any further information about these disintegrators."

Catch Crops with Rubber.

A Travancore planter writes in the January number of the *Tropical Agriculturist* as follows :—

"Being interested in the catch-crop question in new clearings and reading the article contributed by a correspondent in your November issue under that head, I send you the following results obtained here for what they are worth. I have had 24 years' experience of various products. This estate is on low-country level at the foot of the Ghauts, with an annual rainfall of 70 inches fairly well distributed. The clearing was commenced last

year, and rubber planted in June. Cassava was interplanted over 30 acres, and Cambodia cotton over about 100. The Cassava was harvested from August to October this year, remaining in the ground 12 to 15 months. There are varieties here that have to be taken up in 6 months, but others are better left for over a year as the tubers increase greatly in size the latter six months. The cuttings were planted about 5 feet apart on ground previously loosened up about 4 inches. This is not sufficient but I was pressed for time. The crop gave Rs.1,250 which is about Rs.30 per acre. Only 3 feet each side of the rubber was left uncultivated, and this without doubt was too close and retarded the growth of the rubber in that area. This year I am allowing 6 feet on each side and the rubber seems not to be affected. I have also dug the ground deeper, forming beds across the slopes about 5 x 2½ feet, with a catch drain alongside each. This holds all the rainfall even during heavy showers. Cassava being very exhausting, I have found that even on very good soil it does not pay to plant after the third year. On virgin soil with good cultivation I have obtained Rs.100 per acre. I made some into flour; 100 lb. raw root yield 11 lb. flour costing Rs.1·30 to make.

"Cotton does not pay. I only got Rs.120 but have left it over for another year without pulling it up although this year's yield will be four times last, yet it is not profitable. The rainfall is too heavy. I have found it to succeed only where rainfall is about 20 inches with irrigation at intervals. I have this year put in besides the above, groundnuts, gram, ginger, and a few other minor products; it is too early to harvest but I shall be glad to send you the results in about 2 months. I should mention that the rubber is planted 30 feet between the rows to enable catch crops to be grown."

The growing of catch crops with Rubber is a subject which has been much debated and it has I think been generally concluded that it does not pay. Even with Rubber at the wide distance of 30 feet between the rows, it remains to be proved that the profit to be obtained from the catch crops will more than compensate for the possible delay to the Rubber coming into bearing or the extra manures required to prevent this contingency and the extra manure which will have to be applied in later years to maintain the vigour and yield of the rubber when its roots spread into the soil exhausted by the catch crops. At a profit of only Rs.30 per acre this hardly sounds like a paying proposition. It will be interesting, however, to hear of the future results obtained by this planter and I should be glad to have notes for the *Chronicle* from other planters who have had any experience with Catch Crops.

A Good Story.

The *Indian Forester* for October last contains a story which is too good to be missed. Contributed Notes from old Madras Forest Reports conclude as follows:—

"There is an old story dating from the early days of the employment of trained officers which is not contained in any of the annual reports, but which is worth recording. The untrained Deputy Conservator was originally a gardener at home, and had been many years in the Forest Department: shortly after the arrival of his new trained Assistant a man in the local Club remarked; "I say, what is this new Assistant of yours like? I hear that he is a bit of a taxidermist!"

"Taxidermist be d—d," was the reply, "he's just as white as you or I."

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

South Travancore Planters' Association.

Proceedings of the Annual General Meeting held at the Quilon Club, on Saturday, 6th February, 1915, at 10-30 a.m.

PRESENT.—Messrs. L. G. Knight (Chairman), C. Hall, A. W. Leslie, R. J. A. Moore, J. Stewart, J. B. Cook, H. S. K. Morrell, A. Mackie, J. A. Anderson and T. P. M. Alexander (Honorary Secretary), *By Proxy*.—Messrs. L. M. Young, R. Branson, A. H. L. White, T. L. Jackson and R. Ross. *Visitors*—Messrs. W. Clare, E. J. Smith, E. Lord, J. L. Henderson, J. Mackie, J. A. Gwynne, and A. L. Shaw.

AGENDA.

1. Chairman's Address.
2. Honorary Secretary's Report.
3. Election of Office Bearers.
4. Subscription for 1915.
5. Flag Station at Kalthuritty.
6. Subjects for Sri Mulam.
7. Subscriptions to the U. P. A. S. I.
8. Correspondence *re.* godowns at Punalur and Tenmalai.
9. Other correspondence.

The Minutes of the last meeting were read and passed.

Chairman's Address.—"Gentlemen, Owing to the war our numbers are very considerably reduced, 14 men have gone to serve in one capacity or another, the following 6 have gone to enlist: Messrs, J. H. Parkinson, A. V. Cree, M. F. Shore, G. G. Brown, R. Seranckie and C. Seranckie, and the following 5 have received Commissions in the Indian Army Officers Reserve: Messrs. A. G. A. Dunning, W. Chalmers, J. R. N. Pryde, R. M. S. Barton, and J. D. H. Cooke.

I believe this Association was the first to start a day's pay monthly subscription to the war funds, but it has not been very well supported by members.

During the year, a South Indian Labour Commission was started representing approximately 100,000 acres, but this Association did not see its way to join, and with labour plentiful throughout the year, I do not see how this Association can benefit, unless the Commission can limit advances.

The Estates affiliated to this Association have harvested during last year 1,010,000 lbs. of Rubber, at an approximate F. O. B. cost of 69 cents per lb., and 1,600,000 lbs. of Tea at an approximate F. O. B. cost of 28 cents per lb. and the average daily number of coolies employed on the estates was 6,745.

The first meeting of a United Travancore Association was held in Quilon, during June and though little has been done so far, this new Association should prove very useful.

During the year past we have asked for increased godown accommodation at Tenmalai and Punalur, a flag station at Kalthuritty, and European Hospital wards at Quilon and Trevandrum. These matters are still in abeyance, and I trust the present year will see our objects attained.

Our thanks are due to Mr. J. B. Cook for his able representation of the Association at the annual meeting at Bangalore in July.

The price of rubber has kept at a satisfactory level throughout the year and the price of Tea has been, particularly of late, very satisfactory. The

war whilst increasing the cost of production in some ways has helped to show where economies can be effected, and I think we can congratulate ourselves on a successful past year.

The newly inagurated overland route to Colombo is as far as we are concerned, an unmitigated nuisance, it is an uncomfortable journey, takes eighteen hours longer, and is more expensive, and I hope that at the end of the war we shall return to a daily steamer service from Tuticorin.

I now resign my chairmanship, and wish to record my thanks to the Honorary Secretary, Mr. Alexander, for the very little work he has given to me."

The Honorary Secretary's Report.—" Gentlemen,—The acreage subscribing to this Association last year was 12,557 acres being 892 acres increase of previous year. I shall now pass round the audited Balance Sheet and Income and Expenditure account.

War Funds.—We have subscribed Rs.585 to the Prince of Wales' War Fund. This sum was remitted Home by Messrs. Harrisons & Crosfield. Ltd., through their London Office. In October, we subscribed Rs.603-8-0 to the Belgian Relief Fund in Madras. In November, we gave Rs.250 to a member of the Association to go Home and enlist. In December, Rs.216 have been sent to the Belgian Relief Fund in Madras.

Our income yearly, providing all Estates continue to subscribe, is Rs.2,354-9-1, and our obligations are at present:

Lady Ampthill Nursing Institute ...	...	Rs. 100
Honorarium...	...	,, 300
Postages and Stationery ...	...	,, 106
Bangalore and Sri Mulam Delegates' allowances.	..	275

further there is our subscription to the U. P. A. S. I. at 2 annas per acre which amounts to Rs.1,565-2-0 and it is for the meeting to consider whether or not it is worth our while continuing subscribing at this rate.

We have to thank Mr. Henderson for kindly auditing our accounts.

I now place my resignation before the meeting."

Election of Office Bearers.—The following were elected as Office Bearers for the year 1915—Mr. L. G. Knight (Chairman), Messrs. J. Stewart, A. W. Leslie, H. S. K. Morrell, and T. P. M. Alexander (Hony. Secretary).

Subscription for 1915.—This was left over until the following meeting.

Flag Station at Kalthuritty.—The Honorary Secretary read a letter from the Agent of the S. I. R. saying that the prospects of the station are under enquiry.

Subjects for Sri Mulam,—There are no subjects to be brought up this year.

Subscriptions to the U. P. A. S. I.—This was discussed in Committee but nothing definite was decided, and it was agreed to bring the matter up again at the next meeting to be held in May.

Correspondence re. godowns at Punalur and Tenmalai.—Regarding godowns at Punalur and Tenmalai Stations, this matter must be referred to the Durbar and sanction must be got from them and not the S. I. R.

Other Correspondence.—Read correspondence and rules of the Combined Travancore P. A. Mr. J. Stewart was unanimously elected Delegate from this Planters' Association.

(Signed) T. P. M. ALEXANDER,
Honorary Secretary.

THE WAR.

How long will the War Last?

According to Mr. Lloyd George there was not up to the moment when the outbreak occurred a single member of the Cabinet who regarded the present War with Germany even as a possibility. Indeed, until the War was actually in progress it was inconceivable by human imagination that a conflict would arise which would involve half the nations of the earth. Yet this is literally true of the position to-day. And the grim tragedy of it is that all the suffering, all the human misery involved, is to be laid to the account of civilisation. Little wonder that a London Missionary Society has to report a large falling off in the sale of Bibles among "heathens" who are astounded to learn that the Christian nations of Europe are shedding blood at a rate at which it has never been shed before. Little wonder that a great General who has witnessed the carnage on the field of battle, and seen the terrorised inhabitants of peaceful Belgium cities driven from their homes exclaims "The man who is responsible for this war has the soul of a devil."

To attempt to form any idea of the appalling amount of suffering involved would be a hopeless task. But even from the cold, dry figures we may extract ample material with which to show the extent of this gigantic struggle. That half the world is at war is no mere figure of speech may be seen from the following statement.

First as regards territory: –

	Square miles.	
British Empire ...	... 12,000,000	
France (and colonies) ...	... 3,430,000	
Russia ...	... 8,660,000	
Belgium (and colonies) ...	... 920,000	
Servia ...	... 18,800	
Montenegro... ...	... 3,200	
Portugal (and colonies)...	... 837,000	
Japan ...	... 173,000	
	26,042,000	
Germany (and colonies)	... 1,215,000	
Austria-Hungary ...	... 260,000	
Turkey (and dependencies)	... 710,000	
	2,185,000	
	Total...	28,227,000

The total land area of the globe is estimated at 52½ million square miles.

Then as to population:—

British Empire ...	...453,000,000
France (and colonies) ...	... 65,000,000
Russia	...140,000,000
Belgium (and colonies) ...	... 22,000,000
Servia	... 2,750,000
Montenegro... ...	... 230,000
Portugal and colonies)...	... 15,000,000
Japan	... 52,000,000
	758,980,000

Germany (and colonies)	... 72,600,000	
Austria-Hungary ...	 47,000,000	
Turkey (and dependencies)	... 21,000,000	
	140,600,000	
	Total...	899,580,000

and the total population of the world is estimated at 1,800 millions.

Of course, only the smallest fraction of the numbers are engaged, but as regards armies in the field never before have such monstrous figures been reached; and we may perhaps express the fervent hope that never again will the world witness so gigantic a conflict, for—always assuming that the Allies win—we are now fighting the war that will end war. Germany it is said has already lost in killed, wounded and prisoners about two millions of men; on the other side the losses although not so heavy must add well over another million to the terrible total.

Though the expenditure in money is of vastly different importance it is estimated that to keep these armies in the field is costing Europe ten millions sterling per day. And the question is how long can such an enormous wastage of capital be endured? Our military authorities tell us that the war may last three years. From the military point of view this estimate may be based on sound reasoning, and no doubt, great as would be the strain, Britain, France, and Russia combined could hold out for three years if necessary. But the resources ot Germany and Austria are by no means equal to so prolonged a struggle. Germany, indeed, calculated from the first on a war which would last not much more than three months. She sees already that her original careful calculations have totally miscarried: soon she must realise that all hopes of success are utterly doomed. What then will she stand to gain by adding sacrifice to sacrifice?

According to the ordinary rules of war the loser pays the bill, and the collapse of German credit has begun to tell its tale. Six or seven months of war will mean a liability not far short of 2,000 millions sterling, the interest on which alone at 4 per cent. will cost 80 millions sterling per annum. Bitter as the feelings of the loser may be, strong as may be the desire to fight on rather than admit defeat, is there a nation in the world whose advisers will allow this vast expenditure of life and money to continue for a single month after all hope of success has disappeared? It is on these grounds that we set aside the opinions of the military experts and look for a speedy termination of the war. Regard for human suffering we must not expect to find in the counsels of those responsible for this unholy war, but the instinct of self-preservation may yet exist even in the Emperor who has been guilty of the monster crime of the Ages.—*Grenier's Rubber News.*

Synthetic Instead of Vodka.

Your readers may be interested to know that from Russian papers to hand it is learnt that at a meeting of the manufacturers of the spirit used for the production of Vodka one Russian professor read a paper in which he claimed to be able to manufacture synthetic rubber with this spirit as a basis. His invention is being tested in the University laboratories and has attracted much attention.—*Grenier's Rubber News.*

COFFEE.

Its Cultivation and Manuring in South India.

By Rudolph D. Anstead, M.A., published by the Department of Agriculture Mysore State, General Series Bulletin No. 6.

Although coffee is one of the most important commercial crops in Mysore and has been so for many years, it has undoubtedly not received that amount of scientific attention and investigation that its importance deserves. Dr. Lehmann's short bulletin published many years ago although it contains much that is of value, was of necessity incomplete. Mr. Anstead's bulletin therefore comes at a very opportune moment.

As stated in the preface, this bulletin was written especially for the benefit of Indian Coffee planters for whom a Canarese edition is also under preparation. It is therefore couched in simple and clear language and gives as complete a picture of this important crop as it would be possible at the present moment to prepare.

Starting with a general description of the coffee plant, the author next takes up the question of planting in connection with which he touched upon the important subject of seed selection, a subject which undoubtedly has not received that attention at the hands of coffee planters which it really deserves.

The third chapter is devoted to the cultivation and drainage of the soil, in connection with which the question of digging is considered. Shade is next discussed, and in connection with removal of old or undesirable shade trees, the author emphasises the necessity of the removal of stump and roots or of thoroughly trenching around the tree before it is killed. Undoubtedly, the failure to follow this precaution has been responsible for much if not most of the loss from stump rot on coffee estates.

In connection with the subject of pruning, the author notes among other points, the absolute necessity of this, wherever the estate is endangered by the appearance of scale insects. Further interesting chapters on weeding and mulching lead up to the question of the manuring of coffee to which more than half of the bulletin is devoted. Among the most important features is the mapping out of a manurial system which on the one hand may be applied to small estates and on the other may be extended to the largest. This as well as a very clearly written chapter on the valuation and mixing of manures should prove of special benefit to the Indian coffee planters for whom the bulletin is primarily written.

Further interesting chapters on the use of lime and of green manure crops are followed by a short description of the picking and preparing of coffee for the market, which brings the bulletin to an end.

The bulletin as a whole is a decided contribution to the subject of coffee cultivation. There are no doubt parts such as those devoted to cultivation and green manuring which will not meet with the entire approval of all coffee planters. However, Mr. Anstead bases his position on scientific grounds clearly laid out, as for instance, where he touches upon the oft-discussed question of digging, and it would be exceedingly difficult to refute the arguments he advances.

The only side of the subject which Mr. Anstead has not touched upon in more than a casual manner is that of the pests and diseases attacking coffee. This subject, however, is one that for adequate treatment requires a separate bulletin or series of bulletins; and it is to be doubted if the information at hand would in more than one or two instances warrant the publication of a bulletin on the subject.

Although as already stated, this bulletin has been prepared with special reference to the needs of Indian Coffee Planters, it will, I feel sure, also be warmly welcomed by the large body of European Planters, who will find in it much that should prove of real value to them.

LESLIE C. COLEMAN.

RUBBER.

New Uses for India Rubber.

India rubber is the Jacob, the supplanter, of the industrial world. Rubber hose dispossessed hose of leather, the rubber-covered golf ball drove out the "gutty," the motor banished the horse. No industry or profession but has shown rubber supplanting some timehonoured object. Take for example, the case of King David as chronicled in the first book of Kings. "David was old and stricken in years and they covered him with clothes, but he got no heat." Then his servants got a young maid who lay in his bosom to warm him. This system presumably prevailed among elderly kings until 1850 or thereabouts, when india rubber in the form of hot water bottle supplanted the feminine heat supplied, and has done so to a degree, ever since.

Industrially it has insinuated itself everywhere, displacing wood, metals, fabrics and only rarely making a new and original use for its wonderfully adaptable self. It was its costliness only that kept it from further encroachment.

With rubber at a shilling or twenty-five cents a pound (and that is where it is said to be going), the great expansion in its manufacture will be in the line of further and greater encroachment.

Let's afield with fancy and picture its progress :—

The growth that will come in automobile and motor truck tires has already been forecasted, but the impetus to be given to other established lines does not seem to be appreciated. All will grow greatly. The only obstacles are the increasing cost of labour—which is the most serious—and high prices for fabrics, solvents and ingredients.

INDIA RUBBER LEATHER.

In footwear of leather, rubber has already made itself a factor.

Aside from the cements used in channeling and filling, the rubber heel and sole have displaced quite a percentage of those made of leather. With low-priced, high-grade rubber, leather in soles for footwear, material for trunks, straps and a score of other uses, including machine belting and harnesses, is sure to give way to its more adaptable rival. As for shoe uppers, leather is used theoretically because of its porosity that allows heated air to escape and absorbs perspiration—this in spite of the fact that the leather is filled with oil and blacked and varnished. It is quite possible that a mixture of fibre and rubber will appear that will be cool, odorless and blackable.

As for patent leather, it is sure to be supplanted by a smooth, glossy-surfaced rubber product on a cloth backing that will not crack and will be far cheaper than the high-priced leather products. This will open a field in footwear, shopping bags, ladies' belts, etc., etc.

Indeed, wherever leather is used to-day rubber will soon prove a formidable rival.

INDIA RUBBER LUMBER.

Mats, matting and tiling of india rubber are already extensive factors in home, office and factory furnishing. But why not flooring of hard or

semi-hard rubber? As has been proved in tests of tiling wear, it will outlast stone or wood. It can be made in any colour. Certainly at the present price of hardwood flooring, with rubber at 25 cents a pound, it could compete. Nor would it need varnishing, waxing or oiling—simply polishing. It could easily be molded with a semihard lower side for nailing and be matched and furnished in strips of any length or width. It would be practically fireproof, and not inflammable as is varnish-covered wood, and would neither swell not shrink, as it would be moisture-proof and vermin-proof. For a white-ant country it would be invaluable. In cabinet work, hard rubber veneers to imitate ebony, mahogany, bog oak or any of the darker woods are easily made and the richest effects secured. For furniture, solid mahogany sideboards, tables and chairs may he superseded by those made of hard rubber.

In other words, hard rubber lumber is in sight—the lumber sawed, planed and turned as lumber is to-day and the sawdust not a waste product but molded into new lumber, and the furniture or panals or flooring after use returned to the mill that made them, and these, too, made into just as good hard rubber lumber as when first manufactured.

Better than rubber roofing will be the fibre and rubber shingles of the future. If the underwriters are fussy the fibre may be asbestos or the compounding ingredient infusorial earth.

Boat-builders (wooden boats) have trouble with their lumber. When hard rubber lumber is available they will rejoice. It will be hard on those who sell copper sheath of Anti-Teredo paints; for the busy water borer will not touch rubber.

Speaking of hard rubber lumber, who can say that a factory for turning it out will not one day be established in Singapore, to make boxes in which to ship rubber? The boxes, of course, to be sawed up into short vulcanite sheets for insulation work, once their duty as rubber carriers is finished. At least it would not be difficult to make wooden boxes with a thin coating of hard rubber vulcanized to the wood, forming a clean anti-sliver coating. Such boxes could easily be ventilated and should find use when empty.

Great European ports send to South America for Greenheart logs to build their docks, and a costly product it is. Iron columns covered with a thin film of hard rubber should be cheaper and far more durable. So, too, the protection of iron and steel in scores of places where they perish from oxidation would prove a simple, effective solution of this evil.

Semi-Hard Pipe.

As liquid conductors there is a possibility that semi-hard rubber piping may compete with copper and lead pipes. So, too, lead armored cables may give way to those coated with semi-hard rubber. The product would be just as flexible, much lighter, and cheaper.

India Rubber Woodenware.

In the line of sports will come hard rubber golf clubs, cricket and baseball bats, fishing rods, polo mallets and balls, and so on. The city policemen will no longer use a club of locust wood; it will be of hard rubber. And this will extend all through the line of woodenware where anything especially tough, flawless and fine is required.

Rubber Linoleum and Oil Cloth.

Speaking again of floor coverings, oil cloth and linoleum as such cannot exist once rubber is really cheap and plentiful. Every rubber manufacturer

knows that a pound of Pará rubber will go as far in compounding as ten pounds of boiled or oxidised oil. The oil costs, say, seven cents a pound, and rubber at less than four times that price will certainly dispossess it. Then, too, it is more flexible, easier to work and far more durable.

Artificial leathers are likely to find it difficult to compete with the rubber product that will come in with low-priced rubber. Indeed, all of the rubber counterfeits made of cellulose, celluloid or casein, whether soft or hard, are likely to find that the original will be preferred just as soon as it is the cheapest.

Rubber Sound Destroyers.

India rubber as a deterrent to noise has gone far. It will go farther. The rubber-shod taxi-cab has stilled the echoing klipperty-klip of the flat-footed cab horse. It should be used to silence the clash and clatter of the modern city electric car and the jar and clamour of elevated and subway trains. In a score of industries it is needed—as cushions under modern printing presses, laundry machines and other city nuisances.

Would it not be possible also to still the shrill clatter of the thousands of shuttles in great weaving plants by the use of rubber ?

The boiler maker certainly needs some sort of rubber silencer for his work, and the pneumatic riveter will not be perfect until rubber cushions absorb the far-reaching sound of its blows.

When this is accomplished and the day of deliverance comes, every bell in Christendom should send out its peal of praise with soft rubber tongues.

Rubber Glue and Mucilage.

Into the broad field of glues, mucilages and other adhesives will a great variety of new rubber cements force their way. The only deterrent will be high cost of solvent. But with low-priced Hevea rubber and the consequent fall in the price of rubber scrap, that will be melted or distilled, and new stickers and valuable by-products will be obtained that will find wide markets. Certainly a rubber glue that would be self-vulcanising and that would not soften and let go in damp weather would be a boon.

India Rubber Roads.

Roadways of rubber are ideal, theoretically, but the asphalts under modern manipulation are likely to be always cheaper and just as effective. Rubber sidewalks (once a non-slipper compound is evolved) made of scrap are likely one day to run for miles in the modern city.

India Rubber Paints.

These have in the past been widely advertised and sold, but they were oil or asphaltum at heart, not rubber. Scrap rubber is likely to furnish actual rubber paints and real rubber roofing. It will mean experiment and adjustment and a new series of dryers but that should not baffle the chemist in this day of rubber expansion.

Rubber Car Springs.

As the price of rubber in the past increased, certain products disappeared—the rubber car spring for example. As an assistant for the excellent steel springs of to-day, with a new and lower scale of prices it will come back, not only in railway carriages, but in manifold places where cost has prevented its use. Wherever there is a shock there will be put a rubber spring ; wherever a rattle an anti-rattler.

India Rubber Paper.

Goodyear had a book with pages of rubber and fibre. Then rubber became costly and it was forgotten. For certain moisture proof papers rubber is certainly better than oil. In wall papers of the Lincrusta Walton type it is more than a possibility. Bible papers made of pure gum would be wonderfully suited to certain modern creeds.

Rubber Crockery.

It is with much doubt that I make this suggestion—that of white rubber dishes for the great restaurants, or bath tubs of hard rubber for the home. Perhaps it is as well not to encroach upon the pottery industry until rubber becomes as cheap as Kaolin.

The list grows long, and this is but a beginning; there are scores of industries yet to be viewed, and above all the backbone of all prosperity—the former—has been neglected. Perhaps—and this is but a vague suggestion—if he raised his milk-fed chickens on rubber latex, egg shells would cease to be fragile.—*India Rubber World.—The Hawaiian Forester and Agriculturist.*

The announcement of the prohibition of the export of tea to all Continental countries except the Allies, Spain and Portugal will probably have caused much discussion on your side. The general idea is, that tea is a luxury in Germany and Austria used mainly at ladies' afternoon gatherings and is not at all the sort of beverage to be required by our enemies in their trenches. As regards Tommy Atkins, of course, the case is different, and one of the first things to go to the front, after a train-load of jam, must be supplies for the cup that cheers. But our enemies appear to be learning from us in this as in other matters; at any rate the figures are significant. In 1913, the United Kingdom shipped to all European countries excluding Russia 9½ million lbs of tea; in October, only of this year, the export from the United Kingdom reached roughly 12 million lbs, as against 1¼ million lbs. in October, 1913.—*Capital.*

A letter to the *Times* of December 10th, from Mr. F. J. Rogers, of 21 Mincing Lane, E. C., contains the following:—

Within the last few days, however, some very startling figures have been supplied by the Dutch Government showing the export of tea from Holland to Germany, and for the benefit of your readers they are as follows:—

September and October, 1913	... 1,028,356 lbs.
September and October, 1914	... 16,328,464 lbs.

These figures show very clearly that the abnormal exports of tea from this country to Holland during the two months in question were going straight through that country to Germany, and this in spite of the fact that in every case the Dutch importer was supposed to give a signed guarantee that the tea was not intended for Germany.—*Capital*

Tea.

With Indian kinds, the averge for the whole sale on November 5th was 10⅜*d.* per lb. compared with 9¼*d.* per lb. a year ago. With Ceylons, leaf teas were in still greater request than Brokens, and the average realised for the whole sale on Garden Account was 10½*d.*, against 9¼*d.* per lb. at this time last year.

As we go to press, it is announced from the House of Commons that duty has been again advanced to 8*d.* per lb.—*Tropical Life.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 9.] FEBRUARY 27, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert issues a valuable notice to those members of the Planting Community who send specimens of plants for identification. If his suggestions are followed, and they are simple enough, much time and correspondence, and consequently delay, will be saved. He also draws attention to the Circular from the Imperial Institute Bureau of Technical Information which is published in this week's *Chronicle*.

We publish the proceedings of the Annual General Meeting of the Wynaad Planters' Association which is of general interest. We notice that Mr. Abbott who has for so long been Honorary Secretary has resigned, but surmise that this is only because he is going home. Mr. Gillatt was elected to serve in his place.

We also publish the proceedings of a general meeting of the Coorg Planters' Association. We notice that a vote of thanks has been passed to Mr. C. E. McCarthy, Conservator of Forests, Western circle, whose suggestions about the conservation of bees has been adopted by the Government of Madras, and as Mr. McCarthy has gone to Mercara, it is to be hoped that the Coorg Planters' Association will take advantage of his presence among them and get further useful information from him.

From the *Board of Trade Journal* we extract an article on "Tea production in India in 1913." The grand total of exports by sea and land is in favour of 1913-1914 by nearly ten million pounds.

To the *Tropical Agriculturist* we are indebted for an article on "Manuring Tea." The experiments demonstrate that leguminous plants can be cultivated among tea with the most beneficial results. The enormous increase in yield by the use of artificial manures is most marked. We publish the circular referred to by the Planting Expert on the Technical Information Bureau.

In our correspondence columns will be found a letter extracted from the *Times of Ceylon* supplied by the Labour Department.

Mr. Aylmer Martin writes to allay a misapprehension that seems to have got abroad and we trust that his letter will remove any misunderstanding as to his requisition for information.

We publish the Colonial Secretary's circular despatch No. 2 on the Imperial Institute.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Specimens of Plants for Identification.

It often happens that specimens of weeds, leguminous plants, &c. are sent to me for identification and report, but it is very seldom that these are sent in the proper way. The usual procedure is to put a little bit of the plant about six inches long, consisting originally of perhaps half a dozen leaves and a pod, into a card board box, or more often still into a roll of paper, and post it to my office. By the time I get it it is reduced to a bit of smashed up hay, and this I am presumably supposed to be able to name, analyse, and report upon as to its merits as a green dressing, or its harmfulness as a weed.

Not being a wizard, it is necessary that when this kind of information is needed about a plant proper specimens should be sent. These should be prepared as follows. Sprays of the plant about a foot long if it is a big one, or complete plants if a small one, showing leaves, flowers, and seed vessels, should be spread out flat between sheets of newspaper and these sheets piled one on the top of the other and subjected to gentle pressure (such as is produced by a pile of books, say the bound volumes of the *Planters Chronicle*) for a few days till the specimens are dry. They should then be packed between sheets of card board and posted to me in a *flat* parcel. At least half a dozen specimens of each plant about which information is desired should be sent, together with information about the size and habit of the plant, colour of the flowers, &c, &c.

The sort of information which should accompany specimens is illustrated by the following example. "A bushy plant reaching a height of six feet and the stems getting woody. Flowers red appearing in November, seeds ripe in January when the plant dies down. Common in patches among the Rubber especially in rocky places. To be found in similar situtations in the neighbouring jungle."

With specimens and information of this sort plants can be easily identified and existing information about them quickly found.

Imperial Institute Bureau of Technical Information.

In this issue of the *Chronicle* is published a Circular which has been received from the Imperial Institute in London relating to the work of a Technical Information Bureau which has been formed there. The chief work of this Bureau is to supply technical information which will facilitate the use of Colonial and Indian raw materials, in the United Kingdom. The Bureau will from time to time issue special circulars through the Bulletin of the Imperial Institute, or otherwise, dealing with Colonial and Indian raw materials, especially with those which might be more extensively utilised in the United Kingdom.

In sending this Circular the Director of the Imperial Institute says, "At the present time the operations of the Bureau are naturally occupied with the industrial situation created by the War. In this connection circulars dealing with new markets for Colonial and Indian copra, with the uses of West African palm kernels, and with wattle or mimosa bark for tanning, have been issued, and as a result several firms in the United Kingdom have taken up the crushing of copra and palm kernels, and others are taking an increased interest in wattle bark."

The Scientific Department of the U. P. A. S. I. will be glad to receive any suggestions as to how the South Indian planters may benefit by the operations of this Bureau.

RUDOLPH D. ANSTEAD, *Planting Expert.*

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association.

Proceedings of the Annual General Meeting held at Meppadi Club on February 3rd, 1915.

PRESENT.—Messrs. Blackham, Darkin, Malcolm, Milton, Powell, Vernede, Whitton and C. E. Abbott, Honorary Secretary.

Visitors.—Messrs. H. C. Leslie and R. A. Kirkby. Mr. Malcolm in the Chair.

1941. The Proceedings of the last Meeting were confirmed.

1942. *Post Office.*—Read letter to Superintendent of Post Offices, West Coast Division with reference to his promise to appoint an Assistant to the Postmaster. A clerk has been appointed.

1943. *Parcel Post.*—Mr. Malcolm gave a list of parcels to and from his address which had not been delivered or only delivered after great delay. As no explanation has been given in reply to his enquiries, the Meeting directed that the list should be published in the Proceedings and that the Honorary Secretary was to write to the Postmaster-General on the subject.

(1) On 22nd October, 1914 two parcels (unregistered) one containing a "Primus Stove" and the other containing some copper pipes were despatched to Messrs. Oakes & Co., Madras. Messrs. Oakes & Co. acknowledged the receipt of one parcel of Copper pipes on the 29th October, 1914 and they wrote on the 6th and 24th November saying that they had not received the stove. Wrote to Perrindotty Postmaster on the 29th November informing him of this fact to which he replied on the same date that two unregistered parcels were despatched on the 22nd October but as they were unregistered the name of the sender and addressee were not recorded in his books, and that he was writing to the Postmaster, Mount Road. Also drew Postmaster-General's attention in a letter dated December 14th about this and he replied on the 18th December that the matter was receiving his attention. Since then no information has been received nor the parcel returned or delivered to the addressee.

(2) *Late Delivery.*—(*a*) On the 29th November, 1914 a parcel containing Fruit was posted from Bundrole Orchards, Kulu, Punjab, which should have reached Perrindotty Post Office on the 6th, but arrived only on the 10th December, 1914. Addressed Postmaster-General about this on the 14th December enclosing the label of the parcel to which he replied on the 18th December that the matter was receiving his attention. Since then nothing has been heard from him.

(*b*) On the 15th December, a parcel containing some sample screws was sent to Messrs. Walker Sons & Co., Colombo by registered parcel post per receipt No. 12. Messrs. Walker Sons & Co. replied on the 31st December that they had not received the parcel of screws up to that date. Wrote to Perrindotty Postmaster *re* above on the 5th January and he said in reply that he was making enquiry at Tuticorin. Also wrote to Postmaster-General and Superintendent of Post Offices, West Coast Division on the 5th January and they wrote on the 8th and 12th saying that they were attending and enquiring. But in the meanwhile the parcel in question was delivered to Messrs. Walker Sons & Co. on the 8th January (after 24 days).

Non Delivery of Another Parcel.—Another parcel was despatched to the Manager, Women's Work Shop, Madras, in early December about 5th but unfortunately this was unregistered. This also is missing.

1944. *Roads. Vayitri Sultan's Battery.*—Read following letter from Honorary Secretary to the Executive Engineer, West Coast Division.

"Sir,—I have the honour to state that at the last Meeting of this Association complaint was made about the state of road from Vayitri to Sultan's Battery, and I was instructed to address you on the subject. It was suggested that one of our Members who frequently uses the road should be asked to report what portions of it were in bad order. He has written to me as follows:—

"The condition of the P. W. D. road taken as a whole was bad. The vegetation has been allowed to run riot with the result that not only motoring is dangerous but the growth has stopped up the drains and on all the hill, there has been erosion of the road surface by the wash of the rain water. This wash is particularly bad on miles 43 and 44, 53 and 57. Miles 55 and 56 are also in a very bad condition, owing apparently, to no repairs whatever having been done upon them this season. Mile 49 resembles a badly kept bridle path rather than a high road. Some patches were being made on miles 44 and 48 otherwise there was no indication that any repairs were in progress or under consideration, since with the exception of a few heaps on mile 50 and between miles 55 to 60 there was no stock of metal anywhere. The road between Vayitri and Chundale is also very dangerously blind owing to the growth of the vegetation."

"I hope steps will be taken to put the road in order as soon as possible."

I have the honour to be,

etc.

No reply has been received, and according to information furnished by Members very little work has been done on the road since. The Honorary Secretary to write again to the Exective Engineer.

Teriote and Velleramulla Roads.—Read letter to District Board Engineer about the bridges on these roads. Money has been allotted for these repairs and the work has been put in hand.

Road 38.—Read correspondence regarding the allotments on this road: read letter from Mr. J. S. Nicolls sending a list of the allotments on the connected Nilgiri roads. The Meeting is of opinion that considering the state of this road at the end of the Monsoon, either the allotment is insufficient, or it is not spent at the proper time.

1945. *Lady Amptbill Nursing Institute.*—Read letter from Messrs. Harrisons and Crosfield asking if the Association were prepared to subscribe to this. The Honorary Secretary stated that he had referred the question to Dr. Milton, and made what enquiries he could. After some discussion the Honorary Secretary was instructed to write to Messrs. Harrisons & Crosfield stating what the Association is prepared to do.

1946. *Poodupardy Hotel.*—Read letter from C. Changaran asking for an extra allowance for repairs as the building is in a bad state. Resolved to pay Rs.50 for thatching the building and a further Rs.25 when it is reliably reported that repairs to the building have been made. With regard to the stables, it is noted that no repairs whatever have been done,

1947. *Beer shops at Vayitri and Manantoddy.*—Read letter from the Collector of Malabar with reference to the proposed licensing of these. The Association desires to thank Mr. Innes for consulting it, and has no objection to make.

1948. *Madras Planters' Labour Law.*—Read letter to Collector of Malabar enquiring if the appointment of certain Postmasters in Mysore to attest contracts had been made. A reply has been received that the matter is still pending with Government.

1949. *Rubber Association.*—Read letter from Secretary U. P. A. S. I. The Meeting approved of the U. P. A. S. I. subscribing.

1950. *Scientific Officer Scheme.* - It is noted that the proposals made by the Madras Government are postponed owing to the financial stringency caused by the war, and the difficulty of recruiting a Mycologist in present circumstances. The Chairman U. P. A. S. I. has appointed a Committee to discuss the details with view to future action.

1951. *Date of Meeting in* 1915—These are to be held on the 2nd Wednesday of the month, April and May being omitted.

1952. *Planters' Chronicle.*—Read correspondence. The Meeting was of opinion that the *Chronicle* ought to be supplied to Superintendents of Estates whose acreage subscribes.

1953. *Annual Report and Statement of Accounts.*—Mr. Chairman, There have been 5 General Meetings during the year. This is fewer than usual, but there have been two Meetings of the U. P. A. S. I. at Bangalore and two Meetings of the Executive of the Labour Department which have taken up time.

Six new Members have been elected during the year. We have to regret the loss of one Member Mr. West by death. His name appears on the list of Members since 1873.

Two of our Members have gone to England to join the Army, and I am sure you will wish to retain them as Honorary Members till they return.

Prices.—Notwithstanding the War, the price of tea, our chief Wynaad product, has kept at a satisfactory level. The yield was reduced in many cases by the prolonged drought we experienced at the beginning of the year. On most estates there was no rain from the beginning of December 1913 till towards the end of April. Some Estates suffered even longer. The bushes took time to recover, but prospects for 1915 appear to be very good.

Roads.—A good many complaints have been made of the state of disrepair of the D.P.W. road between Vayitri and Sultan's Battery has been allowed to fall into. It is hoped that our representations will have some effect. As regards the Local Fund Roads the only complaints were about the state of road 38 between Chundale and Meppadi where the Monsoon repairs were delayed and some of the bridges on Vayitri Teriot and Velleramulla roads. These have been put in order.

The Sholadi Bridge has been thoroughly repaired with a ferro-concrete platform. So it is permanently in order now. The question has been asked if the amount of money allowed to Road 38 from Chundale to Sholadi is sufficient. Mr. Blake the District Board Engineer considers that it is enough to keep it in fair to good order for cart traffic. The amount allowed for this 18½ miles is rather less than Rs.400 a mile. It carries a heavy tea traffic all the year through especially from where it is joined by the Velleramulla Road, and a great deal of machinery is sent over it. The Nilgiri continuation 25 miles to Gudalar gets practically the same allotment Rs.390 a mile but 18 miles of this distance from Nadgani to Cherambadi carries a very light traffic.

Post and Telegraph Offices.—Our occasional complaints of defects in this service have invariably been attended to by the Superintendent of Post Offices Mr. Ricketts. We were promised an Assistant Postmaster in the Meppadi office which would have resulted in the Post and Telegraph office being kept open from 6 a. m. to 6 p. m. instead of being closed at

inconvenient hours during the day. The disorganisation caused by so many of the staff having to be sent out of India with the troops has prevented this improvement being carried out. We hope it will not be much longer delayed. The question of opening a Telegraph office at Sultan's Battery was alluded to in my last Annual Report. The necessary guarantees were furnished by the Proprietors concerned, but apparently nothing further has been done by the Department.

Madras Planters' Labour Law.—Our repeated requests to the Mysore Durbar to appoint Patels to attest contracts under the Act have been refused. We then asked the Madras Government to recognise Mysore Patels attestations, they being the only officials that our Maistries had any chance of getting to perform this service.

This was under consideration when it was decided to appoint Postmasters in certain offices for the purpose. We have sent in a list of the Post offices in our recruiting areas, and I hope we shall soon hear of these men being appointed.

The recent appointment of the Director of the Labour Department and his European Assistants to attest contracts in Mysore and other Districts will be a considerable advantage to Subscribers in Wynaad and the Nilgiris.

Labour Department U. P. A. S. I.—This Department has been established and is now at work. More than 95,000 acres have joined, and agreed to subscribe Rs.2 per acre per annum for 5 years. Those officials who have to do with Planting Districts have expressed their approval. Mr. Innes the Collector of Malabar in writing on the subject in his Report on the working of the Labour Law, expresses the opinion that the Department if properly worked "will reduce the number of swindlers who both as Maistries and labourers receive advances under fictitious names and false addresses, and it should also check the growing tendency to make excessive advances to Maistries, who, even when honest, are tempted by the sight of large sums of money to undertake to furnish more labour than they can possibly recruit." He adds that "any such result is to be much desired from the Government point of view, as the increasing use made of the Act is becoming decidedly embarrassing." That more than £12,000 a year should have been promised for 5 years by Planters in South India shows that the necessity of the creation of the Department was felt to be an absolute necessity. The Members of the Committee of Control believe that as time goes on, and the benefits to be gained are better understood many of those who are still standing out will join.

I have to thank you all for the support and help I have received during the time I have been your Honorary Secretary. I will now ask you to pass the accounts if they are found to be in order and to accept my resignation.

The Chairman proposed a hearty vote of thanks to Mr. Abbott for his work during the year. This was carried. The accounts were passed.

1954. *Election of Honorary Secretary.*—Mr. T. S. Gillatt was elected.

A vote of thanks to the Chair terminated the Proceedings.

(Signed) B. MALCOLM.
Chairman,

(„) C. E. ABBOTT,
Hon. Secretary.

Coorg Planters' Association.

General Meeting held at the North Coorg Club, February. 18th, 1915.

PRESENT.—Messrs. H. M. Mann, G. R. Pearse, A. L. Alexander, E. L. Mahon, C. G. Maclean, J. Hume, W. R. Wright, T. Hext, G. K. Martin, H. G. Grant, F. Hannyington, I.C.S. (Commissioner of Coorg) P. G. Tipping (Honorary Secretary).

Visitor.—Mr. Alston.

The Honorary Secretary announced the resignation of Mr. J. A. Graham (Chairman) who has gone to the front, the Meeting then voted Mr. W. M. Ball to the chair.

Result of Ballot for the election of Member of District Board for North Coorg, in place of Mr. Graham, Mr. W. M. Ball was returned.

Green Bug—Mr. Anstead's letter asking for figures and results from those who have undertaken spraying was read. The Honorary Secretary made and Mr. Ball seconded a proposal for the election of Dr. Leslie C. Coleman, Director of Agriculture, Mysore, as Honorary Member of this Association.—Carried unanimously.

Bees and Coffee Pollination.—Read letter from Mr. Anstead, and the Madras Government, Revenue Department paper, Mr. Ball seconded by Mr. Mahon proposed a vote of thanks to Mr. C. D. McCarthy, Conservator of Forests, Western Circle, and the Honorary Secretary was asked to go further into the matter with the Forest Department.

Railways.—The Commissioner of Coorg kindly laid before the meeting all the available information regarding the Railway project. The line most favoured by the Chief Engineer comes into Coorg *via* Frazerpet along the North bank of the Cauvery and the cost of this section is estimated at some six lacs, the cess to guarantee interest on this would amount to between 6 pies and one anna per rupee, on the total revenue of the Province. After the matter has assumed more definite shape all information will be circulated throughout the Province.

Labour Rules.—The draft rules circulated by the Labour Department was the next item on the agenda. After some discussion the following Sub-Committee was elected to draw up rules suited to this district and to report before 1st June :—

North :—Messrs. G. R. Pearse, H. M. Mann, C. G. Maclean.

South :—Messrs. E. L. Mahon, H. G. Grant, J. Hume, with the Honorary Secretary, ex-officio.

War Gifts.—A suggestion to hand over the interest due on "fixed deposits" amounting to Rs. 240 did not receive support.

A hearty vote of thanks to the Chair terminated the Proceedings.

(Signed) PERCY G. TIPPING,

Honorary Secretary, C. P. A.

TEA.

Tea Production in India in 1913.

From a report on the production of tea in India in 1913 recently issued by the Commercial Intelligence Department of India, it appears the area under cultivation and the quantity of tea produced in the various Provinces of India during the years 1912 and 1913 were as follows :—

TEA PRODUCTION IN INDIA IN 1913.

Province.	1912. Area. Acres.	1912. Production. lbs.	1913. Area. Acres.	1913. Production. lbs.
Burma ...	1,715	83,287*	3,000	153,797*
Assam ...	361,671	198,798,283	367.549	199,721,950
Bengal ...	150,497	70,524,169	156,002	80,108,705
Bihar and Orissa ...	2,282	269,072	2,160	311,630
Madras, Travancore and Cochin...	58,556	23,615,488	63,708	22,244,680
United Provinces and Punjab...	17,112	4,587,790	17,300	4,708,907
Total...	591,833	297,878.089	609,719	307,249,669

*The produce of the Burma tea gradens is almost wholly converted into *letpet* (wet pickled tea) which is eaten as a condiment. 601,600 lbs. of *letpet*, and only 3,400 lbs. of leaf tea (black), were manufactured in 1913. In the above table the reported figures of *letpet* have been converted into black tea equivalent, 4 lbs. of *letpet* being taken to represent one lb. of black tea.

It may be noted that while the area under cultivation (excluding Burma for the above-mentioned reasons) has increased by 15 per cent. in the decade 1904-1913, the increase in production has been one of 37 per cent.

The reported production of green tea in the last two years (included in the above table) was as follows :—

	1912. Lbs.	1913. Lbs.
Surma Valley ...	977,528	468,858
Northern India ...	1,796,677	2,007,696
Southern India ...	1,822,743	521,399
Bengal and Bihar and Orissa ...	227,772	273.663
Total ...	4,824,720	3.271.616

The following statement shows the quantity of Indian tea exported during the years ended 31st March, 1913 and 1914 :—

Final Destination.	1912-13. Lbs.	1913-14. Lbs.
United Kingdom ...	198,430,842	209.073.152
Canada ...	11,447,520	11,564,565
Russia ...	33,126,071	33,398,209
Australia, New Zealand and Fiji Islands ...	9,396,855	9,704,752
Other countries (by sea) ...	26,200.201	25.778.155
Total exports by sea † ...	278,601,489	289,518,833
Exports by land ...	3,213,840	2,196,208
Grand Total ...	281,815,329	291,715,041

† Including shipments from the State of Travancore.—*The Board of Trade Journal.*

Manuring Tea.

The results of the experiments with Green Manures for Tea in progress at Peradeniya were brought up-to-date in Bulletin No. 9 of the Department of Agriculture published in May of last year. The object of these experiments is to determine whether nitrogen, the most expensive ingredient in artificial manures, could be supplied to tea by growing leguminous plants in the gardens to fix the free nitrogen of the atmosphere. The money expended upon nitrogenous manures in Ceylon amounts to close upon £300,000 per annum, a good proportion of which is on account of tea. This is, therefore, a matter of some concern to shareholders.

The plots, 15 in number each about one acre in extent (figures are corrected for acres), have been under experiment since 1906. Each has been given yearly 200 lb. basic slag and 60 lb. sulphate of potash in order that the tea should not suffer from a want of mineral food. It will suffice if we examine the results of the five plots of Manipuri indigenous, a variety well suited to the elevation (1,600 ft.)

Four were planted with green manures and one left as control. The effect of treatment was not noticeable till 1907, scarcely even then, so the year 1906 may be neglected. Crotalaria (2 plots), Dadaps (*Erythrina*) and Albizzias were the green manures used and the mean yearly yields of made tea per acre for the 7 years 1907-13 were as follows:—

Plots.		Tea per acre, lb.	Relative yield.
146	Control ...	975	100
147-8	Crotalaria ...	1,083	111
149	Dadap ...	1,290	133
150	Albizzia ...	1,015	104

Dadaps increased the average yield by 33 per cent., Crotalaria by 11, but these proportions do not represent the benefit the tea was deriving from the green manures. As humus accumulated year by year we should expect to find results improve correspondingly and this is in fact what happened:—

	Control Tea per acre.	Relative yield.	Dadaps Tea per acre.	Relative yield.
1907 ...	700	100	967	109
1908 ...	591	84	780	111
1909 ...	839	119	1,296	185
1910 ...	1,167	167	1,445	206
1911 ...	1,263	180	1,720	246
1912 ...	1,028	147	1,262	180
1913 ...	1,240	177	1,760	251

In the seventh year after treatment the Dadap plot, the yield of which had increased by 142 per cent. since 1907, gave 520 lb. of made tea per acre, or 74 per cent., more than the control for the same year. The other green manure plots though not so good as Dadaps which are particularly suited to this elevation also showed substantial increases over the control the seventh year. The trials have, it will be seen, demonstrated that leguminous plants can be cultivated among tea with most beneficial results.

The value of Phosphoric acid and Potash as food for tea is illustrated in the experiments by the behaviour of the control plot which, under these manures alone, showed an increase of 540 lb. or 77 per cent. the seventh year as compared with the first.—*The Tropical Agriculturist.*

TECHNICAL INFORMATION BUREAU.

Formation of a Technical Information Bureau at the Imperial Institute.

For some years past a steadily increasing stream of enquiries has been received at the Imperial Institute from manufacturers, merchants and others in Great Britain, the Dominions, the Colonies, and India. These enquiries relate principally to new sources of supply of raw materials, methods of utilising new products from the Colonies and India, or to new or little known processes and machinery for industrial purposes. The number of these enquiries has now become so great that the Secretary of State for the Colonies has authorised the formation of a Technical Information Bureau at the Imperial Institute for dealing with them.

This Bureau has already been at work for some months. It is a special branch of the Scientific and Technical Research Department, and is staffed mainly by experts who have had the advantage of experience in the work of that Department, which is carried on in communication with producers in the Colonies and with manufacturers and users of materials in this country.

The present is a specially opportune moment for the formation of such a Bureau, since the paralysis of German and Austrian trade and industry opens up opportunities for the development of many industries in this country and in the Colonies which have hitherto been monopolised by Germany. Apart from its general activity the Bureau is already playing a part in this special work, and some instances may be given to illustrate the kind of assistance it is prepared to render.

A very important question at the present moment is that of the supply of potash salts, which are essential in certain branches of glass and soap manufacture and for the preparation of a large number of chemicals and manures. Germany has for many years had a practical monopoly of this industry, owing to her possession of the great potash mines of Stassfurt. The only country which has made any attempt to break this monopoly is the United States. The possible sources of supply of potash in Great Britain just now are small, being limited to imports of nitre from India, potash made from Irish and Scotch kelp, and a little obtained as by-products from wool and waste timber. Numerous enquiries have been received at the Imperial Institute from British manufacturers on this subject, and they have been placed in communication with firms who may be able to meet their requirements to some extent. It is quite certain, however, that the existing supplies outside Germany are quite inadequate to meet all the demands, and the Bureau is preparing a statement as to the sources of potash, which will include some hitherto almost untouched for industrial purposes. The necessary enquiries will occupy some time, but it is hoped to issue the statement shortly.

An equally important matter is that of finding markets in this country for the immense quantities of raw materials from India and the Colonies formerly exported to Germany and Austria. As examples of these, palm kernels and copra may be mentioned. These products have been exported on a very large scale to Germany to be worked up into oil and feeding-cake, the former being then largely exported to England. There is no reason why this industry should not be transferred to such great oil-seed crushing centres as Hull and Liverpool. A statement giving full information regarding the German palm kernel industry has been published in the "Bulletin of the Imperial Institute" No. 3 of 1914, and further information is given in

No. 4 of 1914, which also contains a comprehensive article on copra and its utilisation. The Bureau is prepared to place manufacturers interested in these industries in communication with merchants dealing in palm kernels, copra and other raw materials of all kinds.

One of the minor results of the European War is a great scarcity of thymol, a substance extensively used in medicine and pharmacy as an antiseptic. The reason for this scarcity is found in the fact that practically all the ajowan seeds from which thymol is extracted have hitherto been exported from India to Germany. The preparation of thymol from these seeds is a simple chemical process which can be carried on quite easily in this country, and the necessary information for action on this subject has been supplied by the Bureau to various firms of British manufacturers. An article on this subject is published in the *Bulletin of the Imperial Institute* (No. 4 of 1914). Special Circulars drawing attention to Colonial and Indian raw materials of technical interest to British manufacturers will be issued as required, and distributed to all manufacturers likely to be interested. The following circulars of this kind are now available :—

1. New Markets for British, Colonial, and Indian Copra.
2. Wattle or mimosa bark for tanning.
3. The production and uses of molybdenite.

Written enquiries should be addressed to the Director, Imperial Institute, London, S. W., and marked "Technical Information Bureau."

The Bureau is of course only one branch of the Imperial Institute. The Scientific and Technical Research Department of the Institute will continue as before to investigate the commercial possibilities of raw materials from the Colonies and India in its own laboratories and workshops.

The Public Exhibition Galleries of the Institute, which include a complete and permanent exhibition of the raw materials and primary manufactures of the overseas Empire, are continually being added to, and are open daily to the public, free.

18th January, 1915.

FEDERATED MALAY STATES.

Rubber Exports during December, and Year 1914.

The following figures of the exports of cultivated rubber from the Federated Malay States during the month and year ended December, 1914, are taken from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for 1913 being added for purposes of comparison :—

		1913. Tons.	1914. Tons.
December	...	2,616	3,361
January-December	...	23,463	30,697

The figures for December establish a new record for one month's export, while the total for the year, which shows an increase of 7,234 tons over the figures for 1913, establishes a record for the exports during one year. —*The Board of Trade Journal.*

CORRESPONDENCE.

The following appears in the *Times of Ceylon* of February 3rd.

Recent Planters' Meetings.

Sir,—Considering the splendid advance that has been made by a number of estates in Ceylon in the direction of special attention being now paid with the information available, to the care of expectant estate women and child life and the combative measures in force for repressing Anchylostomiasis, it is indeed a matter for lament that some estates are still backward on these points, as has been shown by recent Planters' Meetings. These backward estates constitute as a result a living menace to the good achieved on those that have vastly improved in health and sanitation at very great cost. One estate alone I know of has spent something like Rs. 12,000 for its patent filter, reservoir and clean white piping. Some districts are waiting I believe to do likewise, when the war is over, with Government aid. I have no doubt of the usefulness of the official shovel and broom to pave line compounds and to sweep same, but why should not the "slow coaches," as far as they can, do what Dambulagalla has done or what Kandanewera or Hunasgiriya, Wattegama, is doing to combat this scourge ? On these groups the number of chronic cases has been reduced to almost nil, and I think the Hewahetta district and others will stand to gain much by a look in to any one of these places. It is in the power of every planter to keep his group sanitary and wherever this has been done "poochies" or decomposing organic matter cannot do harm—Yours, &c.,

Z.

Up-country, February 2nd.

THE EDITOR,

The Planters' Chronicle.

Dear Sir,—I see that at the Annual General Meeting of the Mundakayam P. A. held on the 16th January, a resolution was carried unanimously concerning the Labour Department. I could assure the Association that there is no truth in the rumour that subscribers to the Department have been asked to supply it with "as much information as possible" concerning the labour employed on non-subscribing estates, were it not that to meet this rumour with my simple denial would give just as incorrect an impression as is done by the wording of the resolution to which I refer.

I have not got copies of the correspondence with me, but to the best of my knowledge, one officer of the Department, totally ignorant of Mundakayam affairs, wrote to one subscriber asking him from what districts his neighbours got their labour.

I accept full responsibility for his action

To do full justice to the interests of our subscribers, I consider it necessary that every officer of the Department must know about Labour conditions in all those parts of S. India, where his work happens to lie. To base any work on a foundation of want of knowledge is to be unable to give full value to our subscribers. I have made it my own personal business since 1903 to study and know all about the coolies employed, not only on the Estates served by me, but in all districts which affected or were likely to affect my work, including Ceylon and Malaya. At the moment, the interests of my present employers, have for the first time led me to Mysore. With the other officers of the Department, I consider it necessary that they

should have complete and not only a partial knowledge of labour and its conditions, in order that they may properly serve the interests with which they are entrusted. If other estates subsequently become subscribers they will find this determination to do the very best work possible for them, which I am glad to say actuates every officer of the Department, the greatest possible asset.

Yours faithfully.

AYLMER MARTIN.

Balur, 18—2-15.

From

P. B. WARBURTON, ESQ., I.C.S.,

Secretary to the Chief Commissioner of Coorg.

To

THE HONORARY SECRETARY.

United Planters' Association of Southern India,

Bangalore.

Dated Bangalore, 19th February, 1915.

Sir,—I am directed to forward herewith for information, a copy of Circular despatch No. 2, dated the 11th September, 1914, from the Secretary of State for the Colonies, authorising the Imperial Institute to undertake in future for an appropriate fee, researches, investigations, analyses, etc.. required by private individuals and firms.

I have the honour to be,

Sir,

Your most obedient servant,

P. B. WARBURTON,

Secretary to the Chief Commissioner.

Circular (2.)

Downing Street,

11th September, 1914.

Sir,—I have the honour to inform you that my attention has been directed to the yearly increasing demands which are being made on the Imperial Institute by private individuals and firms for reports on technical subjects and especially on the composition and value of raw materials.

2. In the past it has generally been impossible to accede to such requests for investigations from private individuals and firms owing to the pressure of other work. At the same time the conduct of such investigations seems to me to be a legitimate function of the Institute, and I have been given to understand that the demand for such reports would be considerably extended if it were known throughout His Majesty's possessions that the Institute was prepared to undertake for individuals special reports of the kind indicated in paragraph 8 of the Earl of Elgin's Circular despatch of the 31st of July, 1906.

3. Institute, however, is now so completely occupied with the scientific, technical, and commercial researches demanded by the Agricultural, Mines, and other technical departments of the Governments of those parts

of His Majesty's dominions which contribute to its funds that it is impossible to undertake investigations on any considerable scale for private individuals and firms without adding to the technical staff, and therefore to the general expenses, of the Institute. But having decided to meet what I believe to be a growning demand for such work, I am authorising the Imperial Institute to undertake in future for an appropriate fee researches, investigations, analyses, etc., required by private individuals and firms, either in this country or any of His Majesty's oversea dominions.

4. It will be left to the authorities of the Institute to decide in the case of each application whether or not the request for researches etc., is one with which the Imperial Institute can properly comply.

5. Any reports which may be supplied under this arrangement will become the property of those who pay for them and will not be communicated either by the Imperial Institute or by any Government to other persons, or published without the consent of those concerned.

6. As it is undesirable that the Imperial Institute should compete with the professional expert, I propose that only special investigations, etc., should be undertaken, *i. e.*, on subjects of a technical character with which the Imperial Institute is exceptionally qualified to deal, especially those relating to the production and utilisation of materials which occur in the British Empire or which might be introduced into British countries and are considered likely to be of value to British commerce or trade.

7. It may be useful if I refer to some of the more important matters with which the Imperial Institute is in a special position to deal :—

(*a*) Investigations as to the value of new or little known raw materials for commercial purposes.

(*b*) Chemical analyses, assays and valuations of raw materials, such as fibres, rubbers, oil-seeds waxes, food-stuffs, tanning materials, essential and fixed oils, gums, resins, drugs, tobaccos, soils, minerals, ores, waters, fuels, etc., etc.

(c) The technical testing of rubber, timbers, cotton, fibres, cements and other materials.

(*d*) Identifications of vegetable and mineral substances.

8. I am informed that the Managing Committee are not prepared at present to suggest any actual scale of fees which could meet the variety of cases which are likely to occur. The fee must be arranged between the Institute and the individuals of firms who require investigations to be made. The matter will be in the hands of the Director, who will from time to time report to the Managing Committee the fee proposed in any special case in which this cannot be determined by ordinary practice.

9. I believe that the adoption of the plan I have indicated will increase the usefulness of the Imperial Institute to the manufacturing and industrial communities of all countries of the Empire; and as it will doubtless be of importance to the residents of the Colony Protectorate under your Government. I shall be glad if you will take steps to make the arrangement I have sanctioned widely known, either by publishing this despatch in whole or part in the Official Gazette or in such other way as may seem to you to be most effective.

I have, etc.

(Signed) L. HARCOURT.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 10.] MARCH 6, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

NEWS OF THE WEEK.

Bangalore has been favoured with substantial 'Mango Showers' this week, amounting in all to 1'34 inches. Tuesday was quite a monsoon day which must have made our gallant Territorials feel quite homesick. It has laid the dust and freshened things up and brought the 90 maximum temperature of last week down to 80. The rain appears to have been general and several of the planting districts got some; Cochin 4'12, Calicut 1'21, Salem 1'60. Coonoor had nearly 5 inches, and the Nilgiri railway was breached and traffic entirely suspended on Monday. In the Coffee districts this will mean an early blossom, not a desirable state of affairs. Early blossom often fails to set well possibly because the pollen is unfertile. Even if it does set, should the regular monsoon rains be late, a good many berries are apt to fall off during the long period of drought they have to face.

In the Anamallais, Mr. Marsh has laid the foundation stone of the Local Fund Hospital. Mr. Marsh is the pioneer of the district and he contrasted its present appearance, with its magnificent ghaut road and its numerous flourishing estates, with the impenetrable jungle he found when he first went there in 1897. Mr. Marsh sees a bright future for this planting district, and said that when it was realised that even at present constant employment is being given to some 15,000 souls, and that in the near future this number would be largely increased, the absolute necessity not only for this hospital, but for other Government buildings, such as Post and Telegraph Office, Traveller's Bungalow, Police Lines, Chuttrams, and Bazaar would be understood, and he expressed a hope that the Government would see their way to devoting some part of the handsome revenue they now get from the developed district to the improvement of the district along these lines.

The Honorary Secretary of the Coorg Planters' Association, who is in Bangalore with his family for a few days, paid us a visit and added his quota to the discussion of the one and only subject in these days, So many of the young men of Coorg have answered their couutry's call that it seems only the veterans are left to carry on, and long service medals will be much in evidence at the Camp of Exercise of the Coorg and Mysore Rifles which we understand is to be held at Mercara in the middle of the month.

The mail brought us the official report of the fourth International Rubber Congress and Exhibition held in London last July, together with the papers read and the discussions thereon, published at 15*s* 6*d* under the title of of "The Rubber Industry," by the International Rubber and Allied Trades Exhibition Ltd, 75 Chancery Lane, London.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Composts and Manure Heaps.

While in conversation a few days ago with a Coffee planter, he expressed the opinion that he was quite satisfied as to the immense value of dry coffee pulp for bedding cattle in the sheds. This material, he finds, absorbs all the urine and the cattle like it. When removed from the shed it forms almost ideal manure. The same planter continues to make Composts of pulp, line ashes, and yard sweepings in covered pits with a great deal of success and he was lamenting the fact that this year the crop was so small that there would not be pulp enough to supply both his compost pits and his cattle shed.

Messrs. Russell and Richards in an article in a recent number of the *Journal of the Board of Agriculture* (England), state that the losses occurring during storage of a manure heap arise from three causes, rainfall. dissipation of gaseous compounds formed by chemical, and biological actions going on in the heap, and moving the heap. These losses can be prevented altogether under favourable conditions. In heaps stored in the open the losses in Nitrogen were found to amount to as much as 24 to 33%, while in heaps stored under cover the loss only amounted to 7 to 8% of Nitrogen. When a heap under cover is compacted so as to prevent the dissipation of gases, the loss of Nitrogen is entirely prevented. Moving the heap causes a loss of Nitrogen varying from 10 to 27% under all conditions, whether covered or uncovered, compacted or not compacted. The nitrates formed on the outside of the heap are washed by rain, when the heap is exposed and uncovered, into the interior of the heap and there they undergo decomposition with evolution of gaseous Nitrogen and consequent loss. To prevent loss, the heap, whether a manure heap, or a compost heap, should be well compacted, sheltered from the rain, and undisturbed until it is ready to apply.

Minor Products of Estates.

Apropos of the remarks made in these notes in connection with the Imperial Institute Bureau of Technical Information, it has been suggested that it might be useful if the Scientific Department were to publish from time to time information as to where Seeds of green manures, shade trees &c could be obtained, with a view to finding buyers.

The arrangements now in force for the collection of seeds in this country are primitive to a degree, with a few exceptions under Government control intended primarily to aid the Indian planter. Enquiries are often made to me for seeds of plants like Crotalaria, Grevillea, &c., and it is only an accident if I happen to know where any are available.

There must be tons of seed wasted which might be turned into money. The demand for many classes of seed only begins to develop when supplies are seen to be available or to be likely to be so. What is wanted is planters who have seed of green dressings like *Crotolaria striata*, *Tephrosia purpurea*, &c., &c., of shade trees like *Grevillea robusta*, *Erythrina indica* &c., &c., of fuel trees like *Eucalyptus*, *Casuarina*, &c., &c., or other seeds likely to be of value, to let the Scientific Department know when they are likely to become available, in what quantities, and at what price. We would gladly publish such information and it is more than likely that buyers, not only in this country but outside, would be attracted.

Some seeds are ripe and have to be collected during crop time on Coffee estates when coolies can ill be spared for such work, but there must

be many seeds of marketable value which are ripe during an off season which it would pay to collect and advertise. Hitherto the seed of such plants as *Grevillea*, and even common green dressings such as *Tephrosia*, have been offered at ruinous prices and this point calls for attention if a market is to be made. Seeds of staple crops like Tea, Rubber, and Coffee are on a different footing, but it is worthy of notice in this connection that some planters who have paid special attention to the supplying of seed of these have made a respectable profit out of it. Properly handled, there is undoubtedly money to be made out of the supply of seeds for agricultural purposes.

At the present moment I have an enquiry for seed of the following species of *Acacia*, *A. cyanophylla*, *A. decurrens*, *A. pyenantha*, *A. saligna*, and *A. leucophlea*. Many planters grow species of Acacia for shade, green dressings, or ornament; can any one supply seed? If so, when, in what quantity, and at what price?

Markets, &c.

We are indebted to the *Madras Mail* for the following information:—

COFFEE.—The world's visible supply on 31st December, 1914 was 589,115 tons which is far less than in recent years. There is no telling, however, how much coffee is being kept back in the countries of production. As regards the new crop Messrs. T. H. Allan & Co. state there is practically no business in crops 'to arrive,' and that some small lots of Nilgiri and Malabar native coffee have sold at 70*s*. and 61*s*. per cwt. respectively.

TEA.—The total quantity of tea shipped from Madras Presidency ports during January was 3,516,666 lbs. of which 2,459,418 lbs. went to the United Kingdom and 690,083 lbs. to Canada. The balance, which included 50,470 lbs. of green tea, went to Ceylon.

Over 71½ millions lbs. of tea were imported into the United Kingdom during December 1914, as compared with under 42 million lbs. in December 1913. India accounts for over 25 million lbs. of the increase and Ceylon for another 2 million; this was the tea which accumulated in Calcutta and Colombo while the *Emden* was on the prowl.

The figures for 1914 show an expansion of only 9,400,000 lbs. Stocks of tea in bond which fell very low while shipments from the East were interrupted and which at the end of November totalled 75,653,000 lbs., rose considerably owing to the heavy imports in December, and at the end of the year amounted to 121,478,000 lbs., but this is the shortest on record for seven years.

The total exports from the United Kingdom in 1914 were 68,743,978 lbs, a considerable increase over 1913. When it is seen that the amount which went to European countries, omitting Russia, was 30,725,694 lbs. in 1914 as compared with 12,004,091 lbs. in 1913, an increase in round figures of 18¾ million lbs. it is very evident that Germany has been indirectly drawing on Great Britain's stocks. There is in consequence considerable dissatisfaction in London on account of the removal of the embargo among the leading buyers, who object to their supplies being taken from them for enemy consumption while the prices are raised against themselves. The interests of buyers and sellers are diametrically opposed in this matter.

RUDOLPH D. ANSTEAD,
Planting Expert.

FORMOSA CAMPHOR.

Camphor.—The export of Camphor declined from 8,649,319 lbs., worth £553,550, in 1912, to 7,860,854 lbs., worth £495,720. It went to the following countries:—

	1912. lbs.	1913. lbs.
United States ...	2,370,289	3,597,273
France ...	943,536	1,373,564
United Kingdom ...	1,003,086	1,229,647
Germany ...	2,243,366	1,048,295
Japan ...	1,693,969	598,847
Austria-Hungary ...	72,783	13,228
India ...	322,290	—
Total ...	8,649,319	7,860,854

It will be seen that the countries of destination have varied in their amounts very largely. Allowing for the decrease to Japan, the total quantity exported to other countries showed an increase.

The total production of camphor during 1913 was 5,999,538 lbs., to which must be added 3,573,602 lbs. of camphor remanufactured from 7,405,438 lbs. of camphor oil, making the total output for the year 9,573,140 lbs. Considerable stocks were in hand at the end of 1913.

The future of the camphor industry continues to excite some apprehension owing to possible exhaustion of the existing camphor forests and the tendency to diminution has been officially admitted. It is nevertheless claimed that present resources are sufficient to maintain an annual supply of about 6,500,000 lbs. for 18 years, and that by then the afforestation scheme will be far enough advanced for that quantity still to be produced. In 1913, about 3,000 acres were planted with 3,813,000 trees at a cost of £3,500 and as the scheme is to be continued for 12 years, large additions will be ultimately made to the existing reserves. It does not appear that many important new camphor forests are likely to be discovered, as the tree does not flourish more than 4,000 feet above the sea, so that the mountainous interior will probably contribute but little.

Every attention is being paid to render the method of production more efficient. In addition to distilling from the leaves of the camphor tree, efforts are being made to utilise profitably the dwarf camphor tree, which ordinarily produces very little camphor. Again, the 7,000 stills used throughout the country have been, or will be, rebuilt to give more efficient results.

For 1914, the estimated production of camphor is 6,500,000 lbs.

Camphor Oil.—The export of camphor oil increased both in quantity and value, being 4,842,549 lbs., worth £172,620, against 4,475,906 lbs., worth £159,401, in 1912. The whole export went to Japan.

The total production was 7,545,019 lbs., but as mentioned above a large quantity of camphor oil was remanufactured. The remanufacture of camphor oil leaves as by-products, brown oil, white oil, linalool, &c., which were exported to the value of £16,800.

The estimated production of camphor oil during 1914 is about 8,400,000 lbs.—*Diplomatic and Consular Reports, Japan.*

MINERALS AND METALS.

Output of Certain Minerals and Metals in the World.

The Colonial and Foreign section (Part IV) of the Mines and Quarries Report for the year 1912 contains a table showing the output of certain minerals and metals (contained in or obtained from ore raised) in the British Empire and in foreign countries during 1912, which may be summarised as ollows :—

	United Kingdom.	British colonies, Dependencies and Possessions.	Foreign Countries.	Total for the World.
Coal Metric tons ...	264,595,395	49,886,732	935,413,858	1,249,895,985
Copper ,, ...	296	88,998	942,189	1,031,483
Fine gold Kilogs. ,,	41	435,850	276,592	712,483
Iron Metric tons...	4,523,074	1,150,498	66,737,909	72,411,481
Lead ,, ...	19,461	242,785	872,998	1,135,244
Petroleum ,, ...	—	1,102,342	46,084,121	47,186,463
Salt ,, ...	2,156,307	1,708,709	14,105,237	17,970,253
Fine silver Kilogs. ...	3,825	1,552,804	5,626,889	7,183,518
Tin Metric tons ...	5,338	60,798	59,582	125,718
Zinc ,, ...	6,159	203,026	808,564	1,017,749

It is important to note that the quantities of iron and, indeed, the quantities of the other metals included in the above table, are those which are considered obtained from the ores *raised* in the countries in question, and must not necessarily be taken as a measure of the metallurgical industries of those countries. The total value of the estimated output shown in the table may be roughly taken as representing about £1,047,000,000.

The total amount of coal (including lignite) produced in the world in 1912, as shown above, amounted to 1,249,895,985 metric tons, the value of which is estimated at over £481,000,000. The following figures show the main sources from which the coal supply of the world is obtained :—

	1911.		1912.	
	Quantity. Metric tons.	Value. £	Quantity. Metric tons.	Value. £
United States of America ...	450,169,000	128,617,000	484,865,000	142,835,000
Great Britain ...	276,255,000	110,784,000	264,595,000*	117,921,000
Germany ...	234,521,000	87,803,000	255,810,000	100,778,000
Austria-Hungary ...	49,090,000	15,397,000	51,669,000	16,695,000
France ...	39,223,000	23,858,000	41,145,000	25,577,000
Russia ...	26,522,000	Not stated	31,297,000	Not stated.
Belgium ...	23,054,000	13,611,000	22,972,000	15,218,000

* The national strike of colliery workers, which lasted six weeks, occurred in the spring of 1912.

—*The Board of Trade Journal.*

THE BLOW-LAMP.

Explosives and the Blow-Lamp in the Garden.

Whether the spade and the rake will ever become only valuable antiques may reasonably be doubted, but experiments are being made by daring horticulturists to extend the list of garden implements so as to render cultural operations less laborious, and more lasting in effect. In a paper in the *Journal of the Royal Horticultural Society* (August 1914), Dr. H. E. Durham discusses in a pleasant way the use of explosives and the blow-lamp in the garden. By using small (1½ to 2 oz.) charges of cheddite at a depth of 3¼ to 3½ feet and 2 to 2½ yards apart, he came to the conclusion that, compared with the work done by the spade or fork in digging and breaking up the soil, quite ten times as much energy was put into the soil in this way. Although his experiments have not been conducted long enough, he says, to warrant any definite generalization, yet he considers that in all cases a beneficial effect was produced by the explosive treatment. He also believes that the use of explosives gives a means of sub-soiling old borders of herbaceous plants without removing the plants.

As regards the plumber's blow-lamp as a gardening tool, Dr. Durham thinks that its range of usefulness is such that others might like to try it. Pests of the insect world can in some cases be destroyed by it, especially ants' nests. But the chief use to which it may be put is the eradication of weeds in a rapid and effectual manner. They should be attacked while quite small, for then the very slight scorching from the quick passage of the flame over them is enough to destroy them. Even when the weeds in a bed have reached the seeding stage, the lamp may usefully be employed to destroy the seeds, and to prevent a new and probably more prolific crop of the weeds. Another useful function of the blow-lamp is the cleaning off of the unsightly green algal growth which so often disfigures walks and drives, especially in damp whether. Dr. Durham says that a drive so treated by him was rendered free from such growth from October to February, the dampest months in England.

There are therefore, at least, four ways in which a blow-lamp can be put to use in the garden: first, to destroy young weeds; second, to prevent weeds from seeding; third, to tidy up quickly a green walk or weedy path; fourth, to destroy some insect pests.

Should anyone care to experiment in the garden with a blow-lamp, the following description of what it is may be of some assistance:—

The plumber's blow-lamp is a lamp with a blast attachment. It may burn kerosene (parafin) or gasolene (petrol). The burner is arranged so that a jet of the vapour of the kerosene or gasolene is directed into a tubular chimney, usually horizontal. The position and the intensity of the flame is regulated by air pressure, which is produced by a small piston-pump incorporated in the body of the lamp.—*The Agricultural News.*

MARTINIQUE.

Coffee.—The exports in 1913 were only 21,091 lbs. as against 27,447 lbs. in 1912. The imports in 1913 were 231,364 lbs. During the first half of last century the exports of coffee from Martinique were much more important than they are now, but blight attacked the trees with the result that planters abandoned the cultivation of the plant.—*Diplomatic and Consular Reports.—France.*

COFFEE.

The Brazil receipts for the past week, ending January 9th, according to the *Public Ledger*, amounted to 72,000 bags Rio and 174,000 bags Santos, against 33,000 bags and 121,000 bags, respectively for same period last year. The total to date now amounts to 7,699,000 bags, against 10,753,000 bags for 1913-14, 9,195,090 bags for 1912-13, and 9,902,000 bags for 1911-12. The Rio Exchange closes at 14 5-32*d.*

The auctions were resumed in the London spot market on January 5th, when a good supply was offered, and went off irregularly. There was a fair demand for Home trade descriptions, the rates ruling before the holidays being fully maintained. Export kinds, however, were in slow request and nearly all bought in.

Prices realised included *Costa Rica*, low middling to middling colory, 67*s.* to 73*s.* 6*d.*; bold common mixed brownish, 64*s.* 6*d.*; good to fine colory, 80*s.* 6*d.* to 86*s.* 6*d.*; pea-berry, 86*s.* 6*d.* to 100*s.* 6*d.*

Colombian, small fair colory 59*s.*; pickings, 45*s.* 6*d.*; ordinary to fine ordinary 47*s.* to 59*s.*; low middling to middling greenish and grayish, 62*s.* to 68*s.*: good middling colory 69*s.* 6*d.* to 72*s.*; bold good greenish, 68*s.* 6*d.* to 71*s.* 6*d.*; fine colory, 74*s.* to 77*s.* 6*d.*; pea-berry, 71*s.* 6*d.* to 79*s.*

Mexican, small common greenish, 50*s.* 6*d.*; good ordinary mixed greenish, 57*s.* common bold, 62*s.* 6*d.*

Nairobi bold, small fine colory, 71*s.* 6*d.* to 72*s.* 6*d.*; fine middling 80*s.* 6*d.* to 81*s.* 6*d.*; fine bold, 85*s.* 6*d.* to 87*s.* 6*d.*; pea-berry, 89*s.* to 90*s.* 6*d.*

Uganda, small common to fair greenish and colory, 50*s.* to 56*s.* 6*d.*; fine ordinary, 54*s.*; middling, 58*s.* 6*d.*; bold common mixed brownish and greenish, 59*s.* to 60*s*; bold good to fine greenish colory, 67*s.* 6*d.* to 70*s.*; pea-berry, 56*s.* to 68*s.*

Haiti sold, bold pale greenish, 60*s.*

Hybrid Java sold, pale greenish pea-berry and flats 67*s.* 6*d.*; whilst Robusta realised 49*s.*

Washed Dumont (San Paulo) bold, changed hands at 65*s.* to 65*s.* 6*d.* extra bold, 67*s.*; pea-berry, 63*s.*; unwashed (San Paulo), quay terms, sold, very small, 51*s.*; bold, 60*s.*; extra bold, 61*s.* to 61*s.* 6*d.*

Washed Agua Santa, pea-berry, 63*s.*: unwashed, quay terms, small, 46*s.* to 51*s.* 6*d.*: medium, 47*s.* 6*d.* to 52*s.* 6*d*; washed San Paulo, very small mixed, 44*s.* 6*d.*; small, 48*s.*; bold, 60*s.*; pea-berry, 58*s.* to 65*s.*

Sales up to January 15th included Uganda, small common mixed to fine colory, 46*s.* to 59*s.* 6*d.*; good ordinary to fine ordinary greenish 52*s.* 6*d.* to 54*s.* 6*d.*; low middling greenish to good middling colory, 55*s.* 6*d.* to 63*s.* 6*d.*; bold common to good brownish and greenish, 59*s.* to 65*s.* 6*d.*; good to fine colory, 67*s.* 6*d.* to 74*s.* 6*d.*; pea-berry 52*s.* 6*d.* to 75*s.*

Nairobi, small good greenish and grayish, 68*s.* to 69*s.*; good middling, 76*s.* 6*d.* to 78*s.*; fine bold 86*s.* to 86*s.* 6*d.*; pea-berry. 88*s.* to 90*s.*

Washed Dumont (San Paulo) 51 sold, medium, 60*s.* 6*d.*; pea-berry 57*s.* *Unwashed Dumont* (San Paulo), quay terms, 90 sold, bold common, 53*s.* to 55*s.*; pea-berry 54*s.*

Mr. J. P. Wileman, of Rio, in his "M. A. C." (Mainly About Coffee, being the coffee supplement of the *Brazilian Review*) is giving really valuable information of the coffee movements on the Continent especially that which is locked up in the German zone. 700,000 bags of valorisation coffee was reported sold in Hamburg at the beginning of December at 78*s.* per bag, leaving Hamburg and Germany at the time with another 400,00 bags to draw on plus 750,000 that they "bagged" at Antwerp. Previous to the 700,000 bags being sold, free coffee at Hamburg was quoted at 100*s.* a bag.—*Tropical Life*,

LABOUR DEPARTMENT

The "Open" tundu.

The following is an extract from a letter written by Mr. Douglas Berry to the Honorary Secretary, Sabaragamuwa Planters' Association, Balangoda, Ceylon, published in the *Times of Ceylon* of the 24th December, 1914.

".....I paid the coolies on Saturday the 28th November, their October pay and at the end of the pay the Head Kangany asked me for permission to go to Ratnapura to buy provisions. This I granted him and on the following day discovered that he had sold his cattle and transported his line saman, chairs, almirahs etc., to Ratnapura. As this aroused my suspicion I followed him to Ratnapura, where I found he and his coolies (232) had already sent me notice to quit service and leave the Estate on 23rd December. The coolies as a gang are about as fine and healthy a lot as could be seen, not even one shuck cooly amongst them, and the only reason he could have for giving me notice is simply to get rid of his debt which amounts to some Rs.30.000."

Any Kangany in Ceylon can repudiate his debt by giving one month's legal notice. There is no remedy. This is a fact well known to any one who has made a study of labour conditions in the East. It is also perfectly well known to any one who has watched the progress of events, that this fact is the direct result of the open tundu system. In theory this system can be defended on the grounds, that when one Estate has a superfluity of labour, coolies can be handed over to another Estate on payment of their debts, also all advances may be considered good, because some one will always be found to take over the coolies. The following is a specimen of what is frequently to be seen in the reports of Ceylon Tea and Rubber Companies :—

> "There are 1,020 coolies on the group with outstanding advances amounting to Rs.27.858'99 or Rs.27'31 per head, and these are all considered good and recoverable."

These statements are of course absolutely true, because the debts will probably be paid up by some one, but never by the Kanganies or coolies themselves. It has been argued that as the advances are in this way recoverable the conditions in Ceylon are better than in S. India. This statement has even appeared in a previous number of the *Chronicle*.

In practice the whole system falls to pieces and spells loss to the Planting industry in the end. The kanganies and coolies are certainly never going to pay their debts, which will be passed on from the books of one Estate to another, until finally some one will have to write them off.

Let it be remembered that there are Estates in Ceylon, with no advances, with good reliable Kanganies, who in some cases actually finance, so far as the Labour force is concerned, the Estates on which they are employed. I am not writing of these, but confine myself to the Open tundu system.

Let us follow the career of Ramasamy Ky. in the days before the Ceylon Commission of enquiry held in 1908. Besides his debt to the Estate he owed money to "the Chetty" or "the Moorman," who took pro-notes from him. The amounts represented by these had to be paid by Ramasamy's employer, Civil suits with imprisonment for debt was the possible and implied alternative,—or the matter could be settled by the Open tundu. Ramasawmy having got his tundu by amicable arrangement or otherwise for say Rs.3,000 approached the Superintendent of an Estate hard up for labour, and stipulated that besides the debt due to his

previous employer, another Rs.1,000 should be paid to free him of the importunities of the Chetty, and also a further amount for himself—bringing up his total debt to let us suppose Rs.5,000 on the books of the new Estate. After a suitable period of time, the game could be played again and the debt raised to Rs.7,000. In this way bazaar-men and Chetties were enabled to move whole gangs of coolies from Estate to Estate to the immense advantage of themselves. Consequently in the interests of the Planters (!) and as a result of the Commission of enquiry, imprisonment for debt was abolished in Ceylon. It was supposed that the Kanganies as a class were too honest to repudiate their debts to Estates, although they were deliberately given the means of repudiating their other debts, The time has come when Ramasawmy finds the amount of his tundu is inconveniently large. Some Estates might hesitate to take on even 232 coolies, every one of them as sound as a bell, if a sum of Rs.30,000 has to be planked down, and so he takes advantage of what the Law provides, gives one month's legal notice for himself and starts life again with a clean slate. This could be met by an agreement among Planters not to employ Kanganies or coolies who had given notice. It may be said that no reputable Estate would employ such people. I do not like to attempt to define the exact point at which a reputable Estate may cease to become so, but certainly when it is a case of losing crop some one is likely to slacken his efforts to see "the bubble reputation." As a matter of likelihood, it is not to be supposed that a Kangani and his coolies will give notice, unless they have already arranged for employment elsewhere.

The following advertisement in the *Times of Ceylon* of 22nd February is instructive:—

SPECIAL ANNOUNCEMENTS.

Notice Coolies.

Mr. P. L. Palawasamy Pillai, Superintendent of Balangoda Estate, Balangoda, has applied for and received from me the discharge tickets of Supramanian Kangany's 137 coolies who gave me notice, and quitted my service on December 11th last without paying their debts.

B. A. STARLING,
Superintendent,
Hemingford,
Parakaduwa.

I have not gone into the question of coolies being treated as chattels, and moved from one employment to another at the will of a Kangany or some one else. That is another story, which verges on politics. I have given a practical illustration of what the tundu system has led to in Ceylon. Although our present conditions are very different from those prevailing there, is it not right that we should avoid the possibility of our successors ever having to face these difficulties? Can any one doubt the wisdom of those districts in S. India that have some years ago prohibited the use of the Open tundu which can be hawked about from Estate to Estate and from district to district?

I have published this because I have recently found that these things were not known to many subscribers of the Labour Department: my surprise at the prevailing ignorance being more than equalled by the astonishment amounting almost to incredulity, caused by my narration of the facts.

AYLMER MARTIN,
Director.

Bangalore, 28th February, 1915

CORRESPONDENCE.

Daverashola Estate,
Daverashola P. O., Nilgiris,
March 1st, 1915.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

"War Relief."

Sir,—The "One day's pay" per mensem is such a success in Ceylon, do you think Southern Indian Planters would subscribe in a similar way? If so, would it be out of place for you to suggest it in your paper. I would be prepared to subscribe till the end of the war. The control of the subscriptions could be safely left in the hands of the U. P. A. S. I.

Yours faithfully,
J. S. NICOLLS.

COFFEE.

The congestion at the docks, owing, it is said, to a shortage of labour, has kept back recent arrivals, with the result that only very small quantities have been offered at auction this week. These have mostly consisted of very undesirable descriptions such as Robusta and Ecuador, and a few other kinds that are only taken for re-export. With a slow demand these have been difficult to sell and have mostly had to be withdrawn, although in many cases they were disposed of after the auctions. A few parcels of rather finer new Costa Rica were offered yesterday and sold at moderate prices, lower than the opening marks last year. They must not be taken altogether as an indication of the crop, but compared with the same marks in former years the quality is quite satisfactory, with the berry rather bolder than with an average crop. The terminal market has tended downwards owing to the absence of the speculative section which usually rules this market. The receipts have been on the heavy side, and even at present prices, planters and merchants in Brazil are mostly desirous of selling.

LONDON COFFEE RETURNS.

	Home* Consumption.		Export.		Stock.	
	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.
For week ended January 9 ...	305	194	341	219	13,126	11,301

*The Home amount contains a proportion for Export delivered by cart.

OFFICIAL STATISTICS OF THE COFFEE TRADE OF THE UNITED KINGDOM.

		1 month ended Dec. 31.			12 months ended Dec. 31.		
		1912	1913	1914.	1912	1913	1914.
Imports	cwts...	51,366	109,316	105,844	673,982	846,918	1,036,939
Home Consumption	cwts...	17,386	17,752	19,699	259,551	260,396	269,043
Exports	cwts...	20,123	29,664	107,012	439,599	514,712	672,553
Total Deliveries	cwts...	37,509	47,416	126,711	699,150	775,108	941,596
Stock on Dec. 31	cwts...	165,000	251,000	335,000	—	—	—

—*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 11.] MARCH 13, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert writes a note on "Pink Disease" and gives an extract from the *Agricultural Bulletin* of the Federated Malay States, written by Mr. F. T. Brooks, the Mycologist of the Department of Agriculture. Both the Planting Expert and Mr. Brooks concur that the best method of destroying diseased branches is by fire. We note that Mr. R. G. Foster of Sallebile can supply *Crotalaria Striata* seed.

War has had its effects on research of all sorts, so many Chemists having gone to the front,

We publish the first part of an address by Mr. James Graham, President, before the National Association of Education Officers, entitled "Industry and Commerce," with a sub-heading called "Education in Relation to Industry and Commerce." The Empire after the war must be prepared for keen competition and it is only by being forearmed will it be able to uphold its supremacy. The opening sentences of this invaluable and timely address strike the keynote and it is by concerted action that it will be maintained. The President shows how this object is to be attained. It is primarily a question of education, and this education must commence in elementary schools. We are no great believers in too much education, but firmly believe that the mechanic, artisan and factory hand, must have leisure. Adam Smith said that many improvements made in mills have come from mechanics in their leisure time.

We publish from the *India Rubber Journal* the report of Rubber Exports, Straits Settlements, for the three years of 1912-1913-1914.

We are indebted to the *Tropical Agriculturist* for some Hevea Manurial Experiments and for some Tea Manurial Experiments.

The Hon'ble Mr. E. F. Barber, Planting Member of Council, has been selected to represent the United Planters' Association on the Indian Tea Cess Committee, and has kindly consented to do so. No better choice could have been made and the interests of Southern India could not be in better hands.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Pink Disease.

A Correspondent writes saying that it is difficult to burn branches and stems of Rubber, cut out because they are attacked by Pink Disease, in the monsoon especially as dry firewood is now almost cleared off many fields. Moreover, now that the rubber has closed in, it is difficult to burn such loppings without scorching the living trees. Under these circumstances he wishes to know whether the diseased wood might not be buried in pits with Lime.

In the *Agricultural Bulletin of the Federated Malay States* (11'10) there is an article on " Pink Disease" by the Mycologist of the Department of Agriculture, Mr. F. T. Brooks, in which he states.

" Planters sometimes have difficulty in burning diseased branches on account of persistent rain. If it is impossible to burn the diseased parts directly they should be drenched with a 10% solution of Sulphate of Copper, removed from the plantation and buried in the ground some distance away from the rubber trees. It must always be remembered, however, that there is nothing so good as fire for the destruction of fungoid pests."

I heartily endorse Mr. Brook's opinion that the best method of disposing of diseased branches and stems is to burn them if possible. It will be noted that Mr. Brooks says if they are buried they should be "removed from the plantation " for the purpose. It is not advisable to bury large masses of dead wood among the Rubber on account of the danger of Root Disease.

Minor Products of Estates.

With reference to what was said on this subject last week, the first response has just come to hand with which to begin the proposed list, and I trust that other planters with seeds or plants for disposal will also respond.

1. *Crotalaria striata.* Seed—Rs. 6 per bushel.

Available with Mr. R. G. Foster,
Sallebile P. O.,
Kadur District,
Mysore State.

The War and Rubber Research.

The *India Rubber Journal* to hand by this mail points out that one of the most lamentable results of the present War is the diminished activity in research work. Most British and Continental Universities and Colleges have lost more than half of their old and young students and the disorganisation is so fundamental and widespread as to affect for many years the output of scientific work in all departments. Delayed or deferred research represents a great potential loss to every department of the industry for we are living to-day largely on the results of years of persistent labour willingly given by Botanists, Chemists, and Physicists in all parts of the world without whose energy and capacity there would have been no rubber industry. The hope is expressed that rubber chemists will soon be able to regain that peace of mind so essential to laborious, painstaking research.

RUDOLPH D. ANSTEAD,
Planting Expert.

INDUSTRY AND COMMERCE.

Education in Relation to Industry and Commerce.*

Our First Purpose.

We are now in the midst of the greatest struggle that the British Empire has ever been engaged in. The outcome of the struggle involves not only our existence as a nation, but the existence of those principles and ideals of life and government which we hold dear. Our energies, individual and national, must for the moment all be turned to one purpose, to bring the war to a successful conclusion. The men who are fighting at the front are doing magnificent work, but it is for each of us in his own sphere to do his share in order that at the earliest possible moment the world may be free from the terrors of the war.

In time, peace will come. With that peace there will be renewed the international struggle for trade, and British enterprise must be ready to take full advantage of the great opportunities that will then occur. Individual effort will not be of any great use. Concerted action is essential if we are to retain the foremost place in the world of trade; and just as we are vigorous in the pursuit of the present war, so as a nation must we be vigorous in the pursuit of industrial and commercial supremacy.

The Industrial Army.

How is this supremacy to be attained? It is primarily a question of education. We must have in the first instance an industrial army, capable, alert, and well trained. The production of this army must begin in the elementary schools. The leaving age of school children, for urban districts at least, must be raised to fourteen years, and age must be made the only leaving qualification. Moreover, the children should leave at the end of the educational year in which they reach the leaving age, or, at any rate, they should leave only at the end of the school term in which the leaving age is reached. For this reform we must look to Parliament, as it is impossible for a local authority to make the change in view of the many local interests involved.

With the leaving age at fourteen years, local authorities and teachers, after making a careful selection of the boys and girls who should go forward to a secondary school at the age of twelve, could turn their attention to the children left in the elementary schools, who, as a body, may be expected to receive very little general education beyond that obtained in the elementary schools. For these children it would be possible to organise special two-year courses which should prove extremely valuable in preparing them for the work they will undertake on leaving school.

Preparation in the Elementary Schools.

A large proportion of the boys from our elementary schools enter some trade or some branch of industry, and for these the courses of study between the age of twelve and fourteen years of age, while remaining on broad general lines, should be somewhat industrial in character. There is at the present time a strong demand for industrial or vocational education in which practical methods and manual training are involved, but it must not be forgotten that the purpose of elementary education is not to prepare for a particular trade, but rather to develop all the child's faculties so that he may be prepared to enter any walk of life. The all-round

*Address delivered before the National Association of Education Officers on January 1st by the President, Mr. James Graham.

general eduction of the child must be the first consideration, and in the suggested courses of study no attempt should be made to teach any specific trade. The courses would be entirely preparatory and general-trades work, and would involve teaching the theory and principles which underlie British trades generally. "Learning by doing" would take the place of "book learning." An attempt would be made to put the whole boy to school, to train the entire faculties of the boy intellectually, morally, and physically, and so fit him for life. The work which is now generally done in artisan evening schools would be covered by every boy in an urban elementary school, where the work would be done under vastly better conditions, as the teaching would be given to boys who are fresh and vigorous instead of to tired boys who have already done a day's work.

The workshops of the country require boys with self-effort, self-reliance, initiative, and thought, and it should be the object of these courses to provide just that training which would develop these habits. The general adoption of this development in elementary education would create in the near future a supply of intelligent boys, who would rapidly become in the workshops intelligent and skilled workers, ready and able to adapt themselves to the changing working conditions of the trade and of the times; and we should hear no more of the employers' complaint that the present product of the elementary schools is not the type of youth they require in their shops.

In the proposed courses, roughly one-third of the school time of the boy during the age of twelve to fourteen should be devoted to the study of English subjects, one-third to mathematics and technical drawing, and the other third to actual experiments and practical work in the laboratory or workshop. The scheme of instruction would be arranged with the intention of securing an all-round development of the boy's faculties in a thoroughly practical manner, in order that by the time the boy is ready to commence work he may possess ont only a general grip of the principles which underlie trades in general, but such intelligence, reasoning power, and adaptability as are calculated to secure for him the approval and good will of his employer.

This preparatory practical training before the boys enter the workshop or factory is the first step in the production of a capable industrial army. I reiterate that at this stage the practical training must be general; there must be no attempt to teach any specific trade, but every effort must be made by curriculum and by method to develop all the faculties of the boy.

Education of Boys in the Workshops and Factories.

We now come to the second age period and deal with the problem of the boys from fourteen to eighteen years of age. The boys have now left the school. They are in the workshops, and specific trade instruction must begin. Opportunities must be provided for the boy to lay the foundation of a livelihood which in the main will persist through life. At the same time it must not be forgotton that the boy is something beyond a potential wage-earner or producer. He is a future citizen, and in the scheme of education for such youths time and opportunity must be provided not only to enable him to understand the occupation which he has entered and from which he is to obtain his livelihood, but also to enable him to understand his duties as a citizen. There should be provided opportunities for mental, physical, and moral training which shall fit him for manhood and for his place in the nation.

The Teaching of Trades.

The modern workshops are highly organised and specialised with a view to enable employers to reduce the cost of production and to compete successfully for orders; consequently it is practically impossible to-day for an English boy to learn the whole of a trade in a workshop. It is in this connection that the technical schools of the country working in close co-operation with the workshops should fulfil their real function. When the boy enters the workshop his education is far from complete, even if he has had the general practical training outlined above. Continued education applicable to his chosen trade must be given, and the problem that confronts us is how best to ensure that the boy shall have this technical education in spite of the fact that the industrial conditions are vastly different from what they were.

In the old days the employer was the sole educator of his apprentice or young worker. Under present conditions it is impossible for the employer to give the young worker all the instruction he requires. The schoolmaster, therefore, has been called in to undertake part of the work. Under this divided responsibility, the work of the teacher is to give the young worker a thorough grasp of theoretical principles and to provide him with such knowledge and training as will enable him to adapt himself to changed conditions, to attack new problems, and to show initiative and skill in his work. The duty of the employer, on the other hand, is to give that advice and assistance to the teacher as will ensure that the work of the school shall not be merely academic but essentially practical, and to supplement the instruction by doing all that is possible to give the young worker ample opportunities for getting an all-round experience of his trade.

At the present time the young worker is expected to get the necessary technical education by attending the school for three or more evenings a a week after he has done a full day's work in the workshop or in the factory. It is quite unnecessary to point out the drawbacks and disadvantages of this system. Excellent work has been done in the evening schools by youths of grit and character, who have attended them, and a number of employers have done a good deal by means of suitable inducements to encourage their young workers to take full advantage of the opportunities for gaining increased knowledge and experience—but voluntary attendance at evening schools and voluntary schemes of co-operation between employers and educational authorities do not really touch the huge problem. The only effective way to train the rising generation of skilled workmen after leaving the elementary schools is to have half-time in the workshop and half-time at the technical school between the ages of fourteen and eighteen. In the words of our friend, Mr. J. H. Reynolds, the solution of the problem is "Half-time at the right time." Good health and physique are as necessary to the skilled workman as is the technical knowledge applicable to his trade, and the youth should have the opportunity of obtaining this technical knowledge without detriment to his health. In other words, he should be allowed to attend suitable courses of instruction for periods of suitable length within the normal working day.

Half-time in the workshop and half-time at the technical school is certainly ideal, but possibly at present it is not practicable. At least some modification of this arrangement must be adopted to enable young workers to attend day courses on three or four half-days a week, and thus get the necessary continued education during the day-time. Only a small proportion of the young workers of the country attend evening schools in spite of

all the inducements offered and all the encouragement given, and no one would assert that they derive the greatest benefit from their attendance. The result would be infinitely better if the youth spent sixteen to twenty hours a week during the day-time at the technical school and the remainder of his time at the works.

If England is to maintain her place in the world as an industrial and commercial nation, she will have to adopt this method of teaching trades to her boys. Other nations are doing a great deal in this direction. We must do more than they because we have more at stake, and we must act promptly and boldly. Legislation is necessary; it must be made the duty of the employer to allow to the employee the time required for continuing his education according to the requirements of the trade or business which the boy enters. The need for a further limitation of juvenile labour is urgent, and it is equally necessary to place employers of labour under statutory obligation to enable young persons under eighteen years of age who are in their employment to attend courses of technical and general instruction at certain hours of the day-time when they are not too tired bodily and mentally to profit from the instruction. An Act of Parliament limiting the hours of employment for all young persons under eighteen and placing that limit so low that there shall be ample time during the normal working day for attendance of the young people at suitable courses of instruction is required.

The Leaders of Industry.

An army requires capable leaders, and there must be in connection with the training of an industrial army opportunities for the selected few to become successful leaders of industry. For these no education can be considered too good. A thorough training in the secondary schools and the universities, combined with adequate experience in a workshop or factory, is necessary. Science now plays so important a part in industry that more vigorous efforts than hitherto must be made to secure the highest and most suitable education and training for capable youths, and the future leaders of industry in England must be induced to equip themselves for competition on equal terms with the more highly trained young men of other nationalities.

The value of a thorough general education in the secondary school and university cannot be overstated, and full technical knowledge of the particular industry is equally necessary. The training of the young men must be practical as well as theoretical; actual experience in the workshop or factory is as important as the scientific training at the technical college or university, and service in a recognised office, workshop, or factory must be compulsory for a period either before or after the college course, or during the continuance of the college course. The period of training for the men who are to fill the higher posts in industry should be at least for a period of six or eight years, in order that the student may have time to develop his powers of thought and to obtain a complete knowledge of the theory and principles underlying the industry, together with a first-hand knowledge of the processes of the industry obtained by actual contact with it in the workshop or factory.

Some of the highest posts in industry will be filled by men who, in the first instance, enter the works as youths, and who on account of their unusual capacity force their way through the various grades to fill positions of responsibility. It is of the greatest importance that opportunity should be provided for youths of proved ability to secure the education and training

required of those who fill the highest positions in industry if for financial reasons their parents are unable to provide that training. In this connection a duty falls upon the local education authority to make special provision for the benefit of such youths. Scholarships must be provided to enable young workers of proved ability to attend day courses at the technical college or university for three or four years in order that they may obtain a professional training that will prepare them to fill posts of greater responsibility in the future.

In the past, England has had too few specially trained leaders of industry. To organise industry, men, shrewd, enterprising, and with full knowledge regarding the application of scientific methods in the development of industry are required. For these men there must be a most comprehensive and thorough education and training on the solid foundation of a good general education. They must have a sound knowledge of the mutual relation of science and industry and an intimate knowledge of their particular industry in order that all problems may be attacked systematically and on a scientific basis. Men of practical capacity and trained thinkers, endowed with the power of applying their knowledge to the practical necessities of industrial processes are essential in the industrial army, and the absence of a comprehensive scheme for the training of such men must prejudice the future of our country.—*Nature.*

(To be continued.)

Rubber Exports, Straits Settlements.

A cablegram from the Colonial Secretary to the Malay States Information Agency announces that the export of rubber from the ports of the Straits Settlements for the month of December amount to 2,334 tons, as compared with 2,370 tons in the preceding month and 1,217 tons in the corresponding month of 1913.

The total export for the year amounted to 19,727 tons as compared with 11,889 tons in 1913 and 5,799 tons in 1912. The following are the comparative statistics for three years:—

	1912. tons.	1913. tons.	1914. tons.
January ...	253	784	1,181
February ...	274	743	1,703
March ...	427	898	1,285
April ...	387	762	1,548
May ...	431	814	1,309
June ...	398	812	1,480
July ...	380	1,120	1,584
August ...	729	1,315	1,325
September ...	597	1,057	1,602
October ...	550	1,144	2,006
November ...	816	1,223	2,370
December ...	557	1,217	2,334
Total ...	5,799	11,889	19,727

These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, Sumatra, and the non-Federated Malay States, as well as rubber actually exported from the Colony, but *do not* include rubber exports from the Federated Malay States.—*The India-Rubber Journal.*

RUBBER

Hevea—Manurial Experiments.

In the February number of the *Tropical Agriculturist*, the Director of Agriculture, Ceylon, has the following article on the manuring of rubber showing that both to produce girth in the tree and to increase the latex and rubber yield, Phosphoric Acid plays a leading if not a dominant part :—

With the exception of the experiments begun at Peradeniya in the beginning of the year 1914 and which have consequently been running but a very short time as yet there are no records as far as we are aware of experiments in the field to determine the influence of the three principal manurial ingredients on the yield of dry rubber from Hevea.

The Department of Agriculture of the F. M. S. initiated some experiments in 1911 to test the value of different manures on the growth of young rubber trees as indicated by the increase in girth measurement. We have compiled the following table from the account published in the *Agricultural Bulletin of the F. M. S.* of November, 1913 :—

TABLE I.

Plot.	No Manure.	Girth. 1911 in.	1912 in.	increase 2 years.	Relative increase. control =100.
6 & 13	Controls	2'53	9'46	6'93	100
	Nitrogen.				
2	Sulphate of Ammonia Lime	1'90	10'00	8'10	117
	Phosphoric acid.				
8	Double superphosphate ... Lime	2'44	11'88	9'44	136
	Potash.				
7	Sulphate of Potash ... Lime	2'96	11'63	8'67	125
9	Lime	2'73	10'51	7'78	112

TABLE II.

	Nitrogen omitted.				
5	Double Superphosphate Sulphate of Potash ... Lime	2'01	10'94	8'93	129
	Phosphoric acid omitted.				
4	Sulphate of Ammonia Sulphate of Potash ... Lime	2'12	9'94	7'82	111
	Potash omitted.				
1	Sulphate of Ammonia Double Superphosphate... Lime	2'35	11'05	8'70	125
	Lime omitted.				
10 & 11	...	2'91	12	9'09	131

These two tables confirm one another in bringing out the influence of phosphoric acid. In table I, plot 8 manured with phosphoric acid (lime being added in each plot, the soil being very deficient in lime) gave an

increase of girth measurement 36 per cent. in excess of that of the controls which had no manure at all, potash coming next with 25 per cent. excess and nitrogen last with 17. In table II, plot 4 with phosphoric acid omitted gave an increase of only 11 per cent. over that of controls, against 25 per cent. with potash omitted and 29 per cent. with nitrogen omitted. The order in the second table was the same as that of the first, nitrogen being at the bottom in both cases.

It does not, of course, follow that the yield of dry rubber will correspond with the increase in girth and that those trees whose trunks have swelled the most will prove the best. Again, the experiments referred to above have been conducted only with saplings. We don't mean to say that a plantation in which the trees averaged, say, 60 inches in girth would not give more than one in which the average girth of the trees was 30 inches. It might be expected with reasonable certainty to give much more. But we have to await further data before concluding that with trees of the same generation and environment yield of latex is likely to be in proportion to size of girth when the difference in size is not great. In some experiments that were carried out at Heneratgoda in 1913, published in Bulletin No. 4 of the Department of Agriculture, Ceylon, the largest tree under trial, the favour No. 2, with a girth of 117⅓ inches gave in 3½ months 45 lb. 3½ oz. of rubber, a quantity greatly in excess of any other; but it was not the largest tree in the plantation. The next best yielder which gave in the same period 24 lb. 2¼ oz. had a girth of only 65¾ inches and was nearly the smallest of those under experiment. The second largest—girth 115¾ inches—was 11th in order with 11 lb. 11½ oz.; the third largest gave only 8·5 lb. The mean girths and yields of the three plantations were as follows:—

	Mean girth: inches.	Average per tree Dry rubber 3½ months. lb.	oz.
First plantation 15 trees ...	85·88	11	15
Second „ 10 „ ...	76·27	7	14
Riverside „ 13 „ ...	71·57	12	0¾

from which it will be observed that the group of smallest trees gave the highest average yield.

The Peradeniya experiments referred to have not as yet been published, but the results for 1914 have been tabulated and we may be permitted a glance at them. The plot receiving an excess of phosphoric acid gave slightly better results than those receiving an excess of nitrogen and potash. The following table shows the comparison:—

	No. of trees.	Average yield per tree dry rubber. 1914. lb.	oz.
Plot 83, Excess of Nitrogen ...	42	2	6
„ 84, „ „ Phosphoric acid ...	34	2	7
„ 85, „ „ Potash ..	35	2	3

So far as they have gone the Peradeniya experiments tend to confirm the Malay experiments in the good influence exerted by phosphatic manures when applied to Hevea; but as already explained, a year is but a short time for such experiments. The results of one year's working must be distinguished from conclusions which can only be reached after many years when subsidiary influences have been eliminated.

TEA.

Tea Manurial Experiments.

The following results of manurial experiments with Tea carried out on the Pitakande Group of Estates in Ceylon are published in the *Tropical Agriculturist* :—

Plot.			Feb. 1898 to Feb. 1899 lb.	Feb. 1899 to Jan. 1900 lb.	Feb. 1900 to Jan. 1901 lb.	Feb. 1901 to Jan. 1902 lb.	Feb. 1902 to Jan. 1903 lb.	Feb. 1903 to Jan. 1904. lb.
1	Control—No Manure	...	707	784·264	850·625	377·67	500·85	356·582
2	400 lb: Blood meal							
	200 „ Basic slag	...	889	931·709	1,342·626	518·54	828·17	479·072
3	200 „ „ „							
	150 „ Sulphate of potash	...	855	894·007	1,135·074	424·63	638·31	440·964
4	400 „ Blood meal							
	150 „ Sulphate of potash	...	955	960·068	1,520·237	577·06	898·94	502·889
5	250 „ Basic slag							
	400 „ Blood meal							
	150 „ Sulphate of potash	...	1,055	1,056·116	1,461·714	583·18	861·51	547·121
6	200 „ Blood meal							
	250 „ Basic slag							
	200 „ Sulphate of potash	...	1,080	1,064·499	1,386·859	562·77	858·11	585·910
7	400 „ Castor cake							
	400 „ Fish							
	100 „ Sulphate of ammonia							
	100 „ Nitrate of potash	...	1,023	1,064·222	1,403·871	609·04	996·25	645·794
8	800 „ Castor cake							
	200 „ Basic slag	...	1,091	1,067·795	1,394·344	592·03	951·34	579·785
9	800 „ Castor cake							
	900 „ Bone meal	...	962	1,005·631	1,282·062	511·05	786·66	566·855
10	1120 „ Extra dissolved Guano	...	1,026	1,161·220	1,581·482	664·16	717·93	513·097
	Average	...	1,012·8	1,022·807	1,389·807	560·273	837·468	540·165

STACKS.

To find the contents of Stacks.

A knowledge of the weight of hay in a stack is useful in several ways to a farmer—for fire insurance, for instance. It is no uncommon occurrence for one or more stacks to be destroyed by fire either accidentally or wilfully caused. For a very small premium stacks may be insured against fire; and to get at the weight of the contents as nearly as possible is important, in order that the value may neither be over nor under estimated.

Various modes may be adopted, but the only accurate one is by the use of platform scales. The number of tons may be nearly determined by ascertaining the number of cubic feet or yards in the rick, and obtaining the weight per cubic foot by actual weighing.

Weight per Foot.			Yards to a Ton.	Weight per Foot.			Yards to a Ton.
lbs.	oz.			lbs.	oz.		
5	3	=	16	7	8	=	11
5	8½	=	15	8	4	=	10
6	0	=	14	9	3	=	9
6	6	=	13	10	5	=	8
6	14	=	12	...			...

The number of yards per ton will depend on the solidity of settlement of the stack. If a good-sized stack has well settled, about 12 cubic yards to a tons will be fair.

The following rule will give the weight approximately by measurement:—

With a tape measure, measure the length and breadth of the stack, then the height to the eaves, and lastly the perpendicular height from the eaves to the top.

To calculate the quantity proceed thus—

To the height from the ground to the eaves, add one-third of the height from the eaves to the top; multiply this sum by the breadth and the product by the length. This will give the contents in cubic feet, which divide by 27 (the number of cubic feet in a yard) the quotient will be in yards. Divide this by 10 to bring it into tons.

EXAMPLE.

Suppose a stack of hay, 30 ft. in length; 20 ft. in breadth; the height from ground to eaves, 14 ft.; and height from the eaves to the top, 9 ft.

14 feet	=	height to the eaves	} add
3	=	⅓ of height to top	}
17			
20	=	breadth.	
340			
30	=	length.	
10,200	=	cubic feet.	

27) 10,200 (377·7 cubic yards.
10) 377·7 (37·7 tons or 14 cwt.

As the sides of stacks are generally levelled inwards, in measuring for length and breadth take the *mean* rule—that is, measure at half-way up from ground to eaves, and for heights measure perpendicularly.

If the hay is not well settled, divide by 9.

If well settled, divide by 7.

If very compact, divide by 6.—*Queensland Agricultural Journal.*

CORRESPONDENCE.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—I think it would be interesting to more than one of your readers to learn what others thought of the result of manure application given a fair sheet of coffee unmanured the previous season—and manure varying, let us say in price but from 90 to 110 a ton. Would some of your readers kindly state what result per acre they would expect from, say Rs.25 worth per acre—*i.e.*, after adding carriage on the manure, say 4 cwts. per acre.

Yours etc,
COFFEE.

TEA.

Indian Tea.—Although there was a rather quieter tone at the sales this week, there has been little alteration in values. The offerings included rather a larger proportion of very common Leaf than has been available lately, and somewhat better value was obtainable at 9*d.* per lb., while there were more quotations of 8¾*d.* for very common Pekoe Souchong. There was a marked falling off in the quality and appearance of the finest descriptions, and prices suffered accordingly. Medium qualities were well competed for and were fully steady, while all stand out liquoring lots attracted attention. For next week about 63,800 packages are catalogued. The following are the figures issued by the Brokers' Association for the month of January. Imports:—36,569,000 lbs. against 17,690,000 lbs. in 1914; deliveries:—22,736,000 lbs. against 18,734,000 lbs. in 1914; while the stock stands at 82,897,000 lbs. as compared with 91,349,000 lbs. at the corresponding time last year.

Ceylon Tea.—The quantity on offer at the auctions on Tuesday was smaller, and with an active demand, all descriptions were readily taken at firm to occasionally dearer rates. Whole leaf kinds were in good request, especially from about 9¾*d.* downwards, and plain Pekoe Souchongs fetched 9¼*d.*, while broken Pekoes up to 10¼*d.* were frequently dearer. Dusts and Fannings were also very strong. At the public sales 21,115 packages were brought forward, nearly all of which were sold. The following are the figures issued by the Brokers' Association for the past month, compared with January last year:—The imports were 10,544,000 lbs. against 8,072,000 lbs., the deliveries being 7,131,000 lbs. and 9,079,000 lbs. respectively, while the stock stands at 19,411,000 lbs. as compared with 18,078,000 lbs.

China Tea.—There has been no change in this market and prices remain firm. Supplies continue very small and the opportunities for business are consequently restricted. Common Tea are still dear, and 8¾*d.* is practically the lowest price for Leaf Moning. Fine and finest Kintucks, Ichangs and Keemuns are scarce, and prices remain firm.

Java Tea.—Only a small quantity was offered at public sale on Thursday, when about 1,310 packages were printed. The demand was good and prices were unchanged.

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	Lbs.	Lbs.	Lbs.	Lbs.
For week ended Jan. 30...	5,698,497	5,992,633	980,998	1,521,147
For 5 weeks ended January 30 ...	29,029,781	28,426,709	5,070,655	7,160,786

—*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 12.] MARCH 20, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert contributes an interesting article on Root Diseases, and gives a summary of what has appeared for some years past in the *Chronicle*. It is to be hoped the Madras Government will, when they take over the working of our Scientific Department and run it on a broader basis than we can do, add that indispensable person, a Mycologist, to its staff. Notice is also taken of Rubber Markets and the tendency of the English market to absorb everything at advancing prices. The selection of Hevea seed and ground nuts also finds a place in the same article.

The proceedings of three District Planters' Associations are published namely the first annual meeting of the Travancore Combined Planters' Association which was well attended. The second is a report of a general Meeting of the West Coast Planters' Association. The Chairman's address is interesting in that it touches on subjects which have exercised the minds of all planters since the beginning of the War. It will interest all Rubber Planters that it has been decided by the Councillors that the U. P. A. should join the Rubber Growers' Association and an application for membership has been sent home.

The Wynaad Planters' Association proceedings are short and of local interest only. We note that Mr. Whitton has taken over the duties of Honorary Secretary in the place of Mr. Abbott who goes Home in April.

The Director of the Labour Department asks us to notify that "Mr. Lescher having left South Canara with permission for Rawalpindi for training with the Indian Reserve of Officers, a temporary arrangement has been made with Messrs. Volkart Bros. to carry on the Labour Department work until suitable arrangements can be made. In the meanwhile correspondence on Labour matters in South Canara should be addressed to John Hamilton, Esq., Manager, Messrs, Volkart Bros., Mangalore."

The Manager, National Bank of India, Ltd. writes us that "the Directors propose to pay a dividend for the half year at the rate of 16% per annum plus a bonus of 2% making 18% for the year, to place to credit of Reserve Fund £75,000, to credit of House Property Account £10,000 to credit of Officers Pension Fund £10,000, and to carry forward £92,095."

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Root Diseases.

Trouble is constantly experienced in Coffee, Tea, and Rubber from the attacks of fungi on the roots which kill the plants, sometimes quickly and sometimes slowly. This disease is known generally as 'Stump Rot,' but it is caused by several different fungi.

I frequently have specimens sent to me asking what particular fungus has caused the death of the plant and what treatment should be adopted. The first of these questions I am as a rule unable to answer; it is a problem for a Mycologist, and if the U. P. A. S. I. ever get a Mycologist, as they undoubtedly should do, I have little doubt, from the prevalence of this trouble on many estates scattered all over the planting districts of South India, that one of the first matters he will take up, will be the working out of the different fungi which cause Root disease. This has been done in Ceylon, so that the different forms of Stump Rot there are well-known and rapidly identified. Here, however, the work still remains to be done, and until a Mycologist is appointed to work in planting districts it must remain undone, and consequently the specimens sent in must remain unidentified.

With regard to the treatment, however, which in the present state of our knowledge should be the same in all cases, this has more than once been described in the pages of the *Chronicle*. As it still appears to be unknown by many planters a summary of the information which has been given from time to time during the last four or five years may prove of use and interest.

The fungi which cause these diseases are able to spread underground along decaying roots, &c., from tree to tree, so that it often happens that when a plant dies of root disease those round it are also attacked, and then those beyond, and so a patch is formed which may increase to a very alarming extent. Supplies put into such patches are soon attacked and die. The fungi are usually associated originally with the dead stump of a jungle tree in the original clearing, or of a shade tree which has been removed. Not all trees 'produce,' or act as a starting point for, the root fungi, but a great many do so, some being much worse than others. In the case of Coffee, stumps of *Acrocarpus fraxinifolius*, the Howlige, or White Cedar; *Cinnamomum iners*, Yellaga; and *Cinnamomum Zeylanicum*, the Wild Cinnamon, are particularly bad, while in the case of Tea, stumps of *Grevillea robusta*, the Silver Oak; *Symplocos spicata*, the Pithacottai of the Nilgiris; and *Lagerstroemia lanceolata*, the Benteak, are notoriously bad.

There would appear to be no known cure for the disease and preventive methods should be employed. First of all wherever possible *all* stumps of trees should be taken out of the clearings and all dead wood got rid of. This is undoubtedly the best method of all of preventing stump rot.

In Petch's book on *The Physiology and Diseases of Hevea brasiliensis*, the following passage occurs:—" If there were no dead stumps there would be no root diseases either in Hevea or Tea. But it is not an easy matter to get rid of them and whatever method is adopted the cost is high. They have, however, been got rid of in certain cases both in Ceylon and Malaya. In 1906, I recommended that course in dealing with *Fomes semitostus*, and on one affected estate in Ceylon all the stumps were dug out. Several estates have since adopted the same treatment in Malaya, while others are only deterred by lack of funds."

"At the Annual Meeting of the Pataling Rubber Co. in April 1910, it was stated that the expense of uprooting stumps and removing all dead wood came to a total charge, once and for all, of less than six pence for each rubber tree; that is not a very heavy insurance to pay to rid the trees of what may cause a great deal of injury."

In actual estate practice it is often a very difficult matter to remove all dead stumps, though the use of a Trewhella Jack will greatly facilitate the work.

Where stumps must be left in the ground they should be isolated from the crop by means of a trench, at least three feet deep, dug completely round the stump and kept open until it rots and can be buried. This often prevents the fungus reaching the roots of the surrounding Tea or Coffee but it is not always effective, as sometimes the fungus will cross the trench. It is important to keep such trenches open and not to allow them to get filled up with leaves, &c.

In the same way patches which are attacked by the fungus, and where it is spreading, should be isolated by means of a trench, from the unattacked trees before they are treated, care being taken to enclose all the infected land. To ensure this it is well to include a row of apparently healthy bushes all-round within the trenched off area. In digging such isolation trenches the soil taken out of them should be thrown into the enclosed area.

Within the infected area, whether this contains one tree or many, the attacked trees should be dug out with as many roots as possible and carefully burned. The soil should then be forked up to a depth of two or three feet and heaped up, and unslaked lime mixed with it. The heap should be left exposed to the air and sun throughout the dry season. At the same time the drainage should be attended to and improved if the treated patches are large.

The length of time which should elapse before such infected and treated patches can safely be replanted depends upon the extent of the infection. As a rule if the soil is forked over again and slaked lime applied to it at the rate of 2-4 tons per acre at the end of the dry season, supplies may be safely put out with the rains. If the infection was very bad, however, and all the roots and diseased wood were not removed the supplies are apt to be attacked, in which case the process of liming and aeration must be repeated for another year.

In experiments in the West Indies recently reported it was "conclusively proved that the fungus" (Rossellinia) "can live on large pieces of cut branches such as are commonly found throughout Cacao fields after pruning the shade trees &c." This shows the importance of collecting and destroying all dead wood in infected fields. I have seen the disease spread along a dead tree trunk lying on the ground and the Coffee trees on each side of it die one after the other in regular succession.

With regard to the nomenclature of the fungi, as stated above not much is known about them in South India. One fungus *Hymenochaetae noxia*, the Brown Root Disease, undoubtedy exists and is the cause of the death of many Coffee, Rubber, and Tea trees. A description of this fungus will be found in the *Chronicle Vol. V, p.* 509, *Vol. VII, p.* 56, *and Vol. VII, p.* 56, *and Vol. VIII, p.* 52.

On Tea and Rubber another fungus, *Botryodiplodia theobromae*, has been identified. This fungus often spreads from dead *Albizzia*

stumps. A description of it will be found in the *Chronicle Vol. VII. p.* 65.

The fungus which originates in Tea from *Simplocos* stumps is possibly *Poria hypolateritia*, a description of which will be found in the *Chronicle Vol. VII. p.* 58. That connected with *Grevillea* stumps is possibly *Ustulina zonata*, or some fungus closely related to it, a description of which will be found in the *Chronicle Vol. VII. p.* 63. This same fungus is also possibly responsible for a disease of the collar of Hevea Rubber trees recently discovered in the Federated Malay States.

Markets.

Rubber.—The India Rubber Journal says that the English market continues to absorb everything offered at advancing prices. There is an anxiety among manufacturers to be holders of actual rubber instead of covering future requirements by buying futures. This is on account of the uncertainty of deliveries owing to the possible interference with shipping, or the home railways being held up by the Government. Under these conditions actual rubber on the premises seems to be the most comfortable way for the manufacturer to deal with the problem. In spite of large supplies therefore among many adverse conditions rubber is advancing in price. The plantation outputs during January were very large and show great activity on all estates.

Selection of Hevea Seed.

Dr. Cramer presented a paper on this subject to the Batavia Rubber Congress held in October, 1914. He advised the choice of seeds from old trees whose qualities have been tested by long experience. These seed bearing trees should not be tapped, so that all their vitality goes into the seeds, and they should be, if possible, kept to one part of the estate so that all inferior trees near them may be cut out to prevent deterioration by cross fertilisation.

Ground Nuts.

The following Note occurs in a recent issue of *Nature* :—

"With the assistance of the Imperial Institute efforts are being made to create a market in the United Kingdom for the ground nuts grown in India and West Africa and their products—oil and feeding-cake. The export of ground nuts combined amounted to more than seven million cwts. in 1912, of the value of nearly 4,000,000 £., and hitherto France and Germany have between them absorbed the greater part of this supply. The cessation of trade with Germany, and the diminution of the French demand, placed Indian producers in a serious position, and though recently the mills at Marseilles have placed orders with India, the demand from France remains below the normal. A quantity of the nuts has recently been imported into Hull from India for the production of ground nut oil, which is suitable for use as an edible oil as well as for soap-making. Abundant supplies are available from India, and when all food-stuffs are rising in price it is important to remember that ground nuts yield not only oil and feeding-cake, but are also available for edible purposes. In the United States they sell as roasted peanuts, and in the form of "peanut butter." Blanched kernels are regularly used in West Africa as a vegetable, mostly in the form of ground nut soup, but there are a variety of other ways in which ground nuts, which are both palatable and highly nutritious, can be prepared for the table."

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Travancore Combined Planters' Association.

Proceedings of The First Annual Meeting held at the Quilon Club, on 13th February, 1915,

PRESENT.—Messrs. J. A. Richardson, Vice-Chairman, John Stewart and T. P. M. Alexander, South Travancore Planters' Association, C. A. McKenzie, Central Travancore Planters' Association, W. A. Asher, Mundakayam Planters' Association, H. L. Henderson representing Messrs. Harrisons and Crosfield, Limited, J. A. Gwynne, Honorary Secretary. *Visitors.*—Messrs. A. J. Wright, J. B. Cook and L. A. Lampard.

AGENDA.

1. Read notice calling the Meeting.
2. Confirm Minutes of last Meeting.
3. Chairman's Address.
4. Secretary's Report.
5. Election of Office Bearers.
6. Proposed Rules.
7. Discussion of subjects for Sri Mulam.

The Minutes of last meeting were read and confirmed.

CHAIRMAN'S ADDRESS:—Gentlemen,—I am sure we all regret Mr. Valentine, our Chairman and father of the planting industry in Travancore, is not with us to-day. A few months ago owing to ill-health he resigned the Chairmanship of this Association and asked me as Vice-Chairman to take his place. Mr. Valentine is shortly going on a visit to the old country and we all wish him God-speed and trust the holiday will soon restore him to his usual state of health.

This Association was formed a year ago to look after and help the combined planting industries of Travancore and Cochin and their allied interests, with a view to holding a meeting once or oftener in the year if necessary.

The chief reason for calling the meeting now is to enable Delegates to the Sri Mulam Assembly from the different planting districts to meet and discuss their various subjects so that they all understand them and can support one another.

There are often items of General interest to the planting community in the Districts of both States which might be more fully considered and our case strengthened if discusssed at a meeting such as this and I trust more advantage will be taken of it in future.

We have just closed one of the most momentous years in the history of the world. The British nation, her Colonies and commerce were threatened with destruction but thanks to an able Government at Home this crisis was avoided and the tables turned.

So far the planting industry has not suffered to any extent, in fact tea and rubber prices show an advance on what they stood at before the war.

With the exception of a shortage of money for 10 days or a fortnight consequent on the scare at the outbreak of war and for a time a shortage of

shipping while steamers were required for transport purposes things have gone on much as usual.

Our grateful thanks are due to the Banks for the assistance they gave after the first scare was over and I must specially mention the Presidency Bank of Madras, as being a local Government Bank it was in a position to rapidly gauge the state of affairs on the spot and gave great assistance to many who were in trouble owing to the war.

As I said before both Rubber and Tea prices are good but it remains to be seen what will happen when the war is over and every economy is put in force to make up for the terrible expenditure this awful war has incurred. In view of this Company Shareholders must not grumble if substantial balances are carried forward instead of distributing all profits in large dividends.

With shipping too we are likely to have some difficulty and enhanced freights in the near future but I think you will agree with me that it is almost incredible that while practically the whole of Europe is in a state of war our industry is working on smoothly out here, almost as if nothing had happened.

Where we have been hit is through the number of men we have sent to join the forces but that we have done willingly are prepared to send more if necessary but we will hope that necessity will not arise.

The past year has seen the starting of work on the Quilon-Trivandrum Railway and considerable progress has been made with the investigation of the Cochin harbour which promises to be pushed on with.

A large Ropeway is in course of erection between Mundakayam and Peermade which will be linked up by Motor lorries with Kottayam on the backwater and there are already proposals on foot to expedite the backwater journey by means of tugs.

A road is also under investigation joining up the High Range with Peermade which will open up a large tract of country which is at present almost inaccessible and will bring the produce of the Cardamom Hills down to the West Coast.

The Moovatapuzha Bridge between Kottayam and Alwaye is now open for traffic which is a great boon for travellers doing away with the old tedious junga crossing.

A start has been made on one of the bridges on the Kottayam-Quilon Road which it is hoped Government will expedite as much as possible. When this is completed I understand the second ferry will be done away with as this water will be diverted into the first river which will only leave the Chengannore river unbridged.

Another subject which I bring to your notice is the possibility of a landing jetty at Quilon which we hope will meet with favourable consideration from the Travancore Government as it would be of immense value to the planting districts in the south of the State as well as a very large source of Revenue to Government.

I think this covers all the points of interest to us which have come up during the year.

I now beg to tender my resignation.

The Honorary Secretary's Report.—Gentlemen,—My report must be necessarily very brief. Since the first meeting held on 30th June last, all we have done is to prepare the rules which will be submitted at this meet-

ing. Subscriptions have not been levied and the out of pocket expenses for the period amounts to a few rupees only. I suggest that the financial year should end on 31st December.

The Associations which have joined this Association are :—

South Travancore Planters' Association.
Mundakayam Rubber Planters' Association.
Central Travancore Planters' Association.
West Coast Planters' Association.
North Travancore Planters' Association

and the Commercial Firms are :—

Harrisons & Crosfield Ltd., Quilon
Peirce, Leslie & Co., Cochin
Aspinwall & Co., Cochin
Kirkpatrick & Co., Cochin
Parry & Co., Cochin

I beg to tender my resignation as Secretary.

ELECTION OF OFFICE BEARERS.—The following were elected as Office Bearers for this year :—Mr. J. A. Richardson, Chairman, Mr. T. P. M. Alexander, Vice-Chairman, Mr. J. A. Gwynne, Honorary Secretary.

PROPOSED RULES.—The rules as submitted were fully discussed and after certain alterations had been made thereto Mr. Stewart proposed the adoption of the Rules. This was seconded by Mr. Asher and carried *nem. con.*

SUBJECTS FOR SRI MULAM.—The Delegates present discussed the subjects which they had for submission to the Sri Mulam.

With a vote of thanks to the Chair the meeting terminated.

(Signed) J. A. RICHARDSON,
Chairman.

(,,) J. A. GWYNNE,
Honorary Secretary.

West Coast Planters' Association.

Proceedings of a General Meeting held at the Malabar Club, Calicut on the 6th March, 1915.

PRESENT.—The Mooply Valley Rubber Co., per Mr. A. H. Mead, Chairman, The Mooply Valley Rubber Co, per Mr. E. H. Halliley, Pudukad Rubber Co., per Mr. H. Herklots, Cochin Rubber Co., per Proxy, Thodupuzha Rubber Co., per Proxy, Pullangode Rubber Co., per Mr. H. Waddington, Honorary Secretary. Messrs J. Christie and W. O. Wright. *Visitors.*—Messrs. R. H. Crowther and E. H. F. Day.

The Proceedings of the last meeting were confirmed.

207. *New Members.*—Mr. W. O. Wright was unanimously elected.

208. *The Chairman's address.*—Mr. A. H. Mead then addressed the Meeting as follows :—I do not intend to take up much of your time in re-

viewing the events of the past year, but 1914 or rather the latter part of it has been an anxious time for all of us and it is as well to record what has taken place.

At the outbreak of war, few of us I imagine thought that matters would remain as normal as they are to-day.

In the beginning there were fears entertained that financing estates would be difficult or even impossible. The exchange banks could not help us but the Bank of Madras afforded invaluable assistance as also did the Coast Agency firms to proprietors.

Rubber prices have kept up wonderfully and the margin between fine Hard and Plantation is actually smaller to-day than when the war broke out.

The exploits of the *Emden* for a time resulted in shipping being practically suspended and freights have since risen and are rising still.

The Country's call to arms has not been unheared and numbers of our members have gone home to fight or joined the Indian Army Reserve of Officers. Many others would have gone had they consulted their own inclinations but have stayed behind and carried on simply because they realised how much their leaving would embarass their employers.

The members of the S. P. M. R. turned out and did garrison duty at Malapuram when the Buffs were under orders for the front.

Germany's so-called blockade which is piracy pure and simple has been widely advertised in the Fatherland as going to prove the ruin of British commerce but I think we can trust our Navy to see that business is as usual.

The Rubber Exhibition in London was a success and our produce is generally being more appreciated by the manufacturers who are in many cases finding that Plantation can be used in the place of Brazil rubber.

Opinions seem divided as to the probable duration of the war but we all hope for a speedy termination and peace on terms that will ensure the World against another upheaval in our and our children's time.

Turning to local matters, the most important event of the year is the institution of the Labour Commission. We are all entitled to our own opinion as to the utility of the scheme but we all hope that it will prove as successful as its promoters anticipate. I think, however, that there is very considerable feeling in several quarters that there must be complete separation between the Commission and the U. P. A. S. I. Otherwise I think a considerable acreage will secede from the Association. I would draw attention to the meetings of the South Travancore and Mundakayam Associations.

The whole burden of Association affairs has fallen on Mr. Waddington once more and but for his energy, tact, and enthusiasm I am afraid the W. C. P. Association would be in a bad way.

I have to thank you for putting up with my inefficiencies as a chairman and now retire to leave the post in more capable hands.

209. *The Honorary Secretary's Report.*—From the preliminary statement of accounts, laid on the table, it will be seen there is a credit balance at end of 1914 Rs.896—7—2 as compared with Rs.114—12—3 at the end of 1913.

After meeting our subscriptions to the United Planters' Association of Southern India and Lady Ampthill Nurses Institute the ordinary expenditure for 1914 amounted to Rs.40-8-4 compared with Rs.318-2-11 in 1913, but payment of our Delegates expenses to Bangalore in 1914 was overlooked and nothing has been so far paid on that account, any amount voted now must be deducted from the balance to be brought forward to 1915.

Three Companies have joined the Association during the year which compared with 12,757 acres subscribing and closes with 14,055.

One private member has joined, one resigned during 1914 and one has been elected to-day making the present number eleven.

During the last four months many of our members have joined the Army. Estates should therefore send a revised list of Assistants in order that Lady Ampthill Nurses Institute may be advised and the list of members be brought up to date.

(Signed) H. WADDINGTON,
Honorary Secretary.

Mr. Mead proposed and Mr. Herklots seconded a hearty vote of thanks to Mr. Waddington for his services at Bangalore and that he be granted Rs.200 as expenses.—Carried unanimously.

210. *Accounts* 1914.—These were laid on the table.

Arrears due by Central Malabar Syndicate.—Correspondence between Honorary Secretary and the Manager and Acting Manager of the Syndicate were read and it was resolved to write off the small amount outstanding as irrecoverable.

With this addition and that made by resolution under Minute No. 209 the accounts were confirmed and passed and the Honorary Secretary was asked to print them as revised, together with his Report, in the Proceedings.

Other Arrears.—The Honorary Secretary was instructed to address Mr. Scholfield with regards the subscription due by the Mysore Rubber Syndicate.

211. *Southern India Planters' Benevolent Fund.*—The Honorary Secretary reported that Rs.260 had been collected and remitted the Fund during 1914, compared with Rs.395 in 1913, and that he was afraid amount would show still further falling off this year, as two members had completed their subscriptions and become life members.

212. *Rubber Growers' Association of Southern India.*—Read correspondence between Honorary Secretary and the Mundakayam, Central and South Travancore Planters' Associations, all of whom approved of the idea of forming such an Association. The meeting agreed with the suggestion of the South Travancore Planters' Association that the matter might be left to the newly formed Travancore Combined Planters' Association.

213. *Rubber Growers' Association (London).*—Read circulars from U. P. A. S. I. The Honorary Secretary's action, as a Councillor, in voting in favour of the U. P. A. joining the Rubber Growers' Association was approved.

214. *Travancore Combined Planters' Association.*—Correspondence was laid on the table. The Honorary Secretary reported that with approval

of the Committee the West Coast P. A. has become a subscribing member of this new Association.

215. *Indian Tea Association.*—The Honorary Secretary reported that he has voted in favour of a new representative of the U. P. A. being elected to Committee of this, but that as we were as an Association so little interested in Tea, he had left selection of representative to those Association, more nearly concerned in the matter.—Confirmed.

216. *Scientific Officer Scheme.*—Correspondence was laid on the table. The Honorary Secretary reported that the suggestion made that U. P. A. Scientific Department should be handed over to Government had met with general support, that the Chairman had suggested a way to supply the funds required by Government when owing to outbreak of the War Government had had to postpone consideration of the whole question. The U. P. A. had then selected a Committee to prepare a definite programme to place before Government and us when matter could be taken up again.

Members noted that two of that Committee have gone to serve the Country and Honorary Secretary was asked to ascertain who now form the Committee.

217. *War Funds.*—It was resolved not to make any separate and special appeal through this Association.

218. *U. P. A. Labour Department.*—Resolved that this Association considers the name of the United Planters' Association of Southern India Labour Department should be altered by the elimination of the words "United Planters' Association."

219. *Office Bearers 1915.*—The following were elected :—

Chairman	...	Mr. A. C. Morrell.
Committee	...	Mr. A. H. Mead. Mr. E. H. Halliley.
Honorary Secretary	...	Mr. H. Waddington.

220. *Finances 1915.*—It was resolved that the subscription for 1915 be reduced to 2½ annas per cultivated area.

A vote of thanks to the Honorary Secretary and Members of the Malabar Club for the use of the room was carried unanimously.

The Chairman spoke a few words regarding the pleasure it has given Members to meet Mr. Day, the Deputy Commissioner of the Labour Department and proposed a vote of thanks to Mr. Waddington for the work he had done in the past as Honorary Secretary and for consenting to continue the work in the future.

With a vote of thanks to the Chairman for his services at this meeting and during the past year the proceedings closed.

(Signed) A. H. MEAD,
Chairman.

(„) H. WADDINGTON,
Hony. Secretary

Wynaad Planters' Association.

Proceedings of a Meeting held in the Meppadi Club on the 10th March, 1915.

PRESENT.—Messrs. Abbott, Bisset, Blackham, Copland, Darkin, Gauld, Powell, and N. C. Whitton (Honorary Secretary).

Mr. Abbott in the chair.

1955. HONORARY SECRETARYSHIP.—The Chairman announced that Mr. T. S. Gillatt was unable to accept the Honorary Secretaryship, and that Mr. N. C. Whitton, who was next in the ballot, had taken over the duties.

1956. NEW MEMBER.—Mr. R. Copland was elected a member.

1957. PROCEEDINGS OF LAST MEETING were confirmed.

1958. POST OFFICE.—Read letter to the Superintendent of Post Offices, Malabar Division, with reference to the keeping of the Meppadi Post Office open from 6 A.M. to 6 P.M. and his reply, stating that the matter would be duly considered.—Noted.

The subject of the Sultan's Battery Telegraph office was mentioned. Mr. Copland was requested to address Messrs. Harrisons and Crosfield, Ltd., to ascertain what has been done in the matter, and to bring the subject up again at the next meeting.

The Honorary Secretary was instructed to write to the Superintendent of Post Offices, Malabar Division, with reference to the removal of the Vallara Malla Post Office to a site on Churalmalla Estate.

1959. ROADS.—Read Honorary Secretary's letter to the Executive Engineer, West Coast Division, *re* the Vayitri-Sultan's Battery Road. Further complaints have been made regarding the bad condition of this Road.

1960. LADY AMPTHILL NURSING INSTITUTE.—Read Honorary Secretary's letter to Messrs. Harrisons & Crosfield, Ltd., and their reply. —Noted.

1961. IMPERIAL INSTITUTE. FORMATION OF TECHNICAL INFORMATION BUREAU.—Read Mr. Anstead's letter. Members who are interested in any of the products mentioned are asked to address Mr .Anstead through the Honorary Secretary.

1962. MONEY ESCORT FROM THE NILGIRIS.—Read letter from Honorary Secretary, Nilgiri Planters' Association, with reference to arrangements being made with the District Superintendent of Police, Nilgiris, *re* Police Escorts from Ootacamund for coolies with cash for outlying Estates. Members to address the Honorary Secretary if they wish to avail themselves of the Escort.

1963. LABOUR LAW.—Several cases have been brought before the Sub-Magistrate of Vayitri, under Section No. 35 of the Madras Planters' Labour Act 1903, in which further proceedings were barred after two convictions of the accused, owing to the Honorary Mr. Justice Sadasiva Iyer's ruling. It was resolved to take a typical case before the Bench of the High Court of Madras, so as to get the point definitely settled. Proposed by Mr. Bisset and seconded by Mr. Abbot.—Carried unanimously.

PAPERS ON THE TABLE.—Copies of "A lesson on Malaria."

A vote of thanks to the Chair terminated the meeting.

(Signed) C. E. ABBOTT, *Chairman.*

(„) N. C. WHITTON, *Hon. Secretary.*

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry* should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials.

Tin boxes should be used for packing, and holes should not be bored in them or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper, to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 13.] MARCH 27, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

Mr. Anstead, Planting Expert, and the Secretary of the United Planters' Association attended a meeting in Madras on the 24th instant to discuss the Scientific Department being taken over by the Madras Government. The Planting Expert attended that meeting only and the Secretary on the 25th attended a meeting of the Control Committee of the Labour Department. It is hoped at a later stage to publish the results of both meetings. The Secretary apologises for the slight delay that has occurred in answering letters.

The Scientific Department publishes a valuable article on cattle manure, giving tables of analyses, and ending up with the importance of sheltering manure from rain and sun.

The Proceedings of the twelfth Annual General Meeting of the Anamalai Planters' Association are published.

We publish an article on the duration of the action of Fertilisers based on experiments carried out at Rothamsted since 1904.

Under the heading of "Rubber," we extract a summary from the *India Rubber World* of the papers read at the Batavia Rubber Congress which should prove of interest to all Rubber planters.

Concluded in this issue is the valuable paper extracted from *Nature* on "Industry and Commerce." It will be seen that to carry the majority of the trade of the world is not sufficient, but that to compete with those foreigners who have hitherto been the parasites of our commerce, the youth of England must be commercially trained. The lessons of this war will have been lost if a change does not come over the spirit of our dreams. It will not be sufficient to crush military despotism, but the Empire must succeed and retain the pre-eminent place in Commerce to which she is justly entitled. Napolean I called us a nation of shop-keepers. Why not? Commerce has its victories no less than War and will be of more lasting benefit to mankind.

The Manager of the Mercantile Bank of India, Ltd., writes to inform us that "The Directors recommend a dividend of 8% free of Income Tax for the year ending 31st December last on both 'A' and 'B' shares. They propose to place £35,000 to Reserve Fund and carry forward £47,200."

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Cattle Manure.

The necessity for organic matter in plantation soils is preeminent and bulky organic manures are constantly being applied in consequence. Among these the most valuable is Cattle Manure if it can be obtained. The grades of Cattle Manure available on most estates vary from good to material which does not pay for cart hire to put out. I have just had two samples through my hands which illustrate this; they were described as samples of Cattle Manure which is usually applied to Coffee. The analyses of these samples are as follows:—

	I		II	
	Sample as received.	Calculated to dry matter.	Sample as received.	Calculated to dry matter.
Moisture ...	39·84	—	17·14	—
*Organic Matter ...	30·60	50·93	14·57	17·59
†Soluble Ash ...	5·82	9·67	12·58	15·18
Insoluble Matter ...	23·70	39·40	55·71	67·23
	100·00	100·00	100·00	100·00
*Containing Nitrogen ...	1·18	1·96	0·35	0·42
†Containing Phosphoric Acid ...	0·44	0·73	0·34	0·41
Containing Potash ...	0·45	0·75	0·86	1·04

The average composition of Indian Cattle manure is given in the following table, the figures having been obtained as an average of many years' experiments at the Koilpatti Agricultural Experiment Station :—

	Box.	Heap.	Pit.	Village Manure.
*Organic Matter ...	56·90	38·87	45·01	30·90
†Soluble Ash ...	13·22	10·50	13·95	10·72
Insoluble Matter ...	29·88	50·63	41·04	58·38
	100·00	100·00	100·00	100·00
*Containing Nitrogen ...	2·07	0·81	1·22	0·58
†Containing Phosphoric Acid ...	0·93	0·54	0·76	0·41
Containing Potash ...	3·26	1·40	1·90	0·56

It will be seen that the first of the estate samples is fair but low in Potash, but the second is very low grade material indeed.

The value of Cattle Manure almost entirely depends upon the way in which it is made, and the care taken to prevent loss of plant food. It is important not to lose the urine from the manure. This is richer in nitrogen and potash than the solid excrement which contains most of the Acid. The amount and composition of the urine is more constant than that of the solid excrement, 57 to 79% of the total nitrogen of the food being excreted in the urine and from 16 to 22% in the solid excrement. The Madras Agricultural Department gives the following methods for making good Cattle manure:—

(1) Dry earth is spread, at the rate of about two cart loads per pair of bullocks on the floor of the Cattle shed. The dung is removed daily, and the earth kept dry by being turned over wherever it has been wetted. The dung is put into a pit not less than three feet deep. The earth remains sweet and forms a good bed for the cattle for five months. At the end of this time the earth is removed and forms a very good manure, certainly as good as the dung without the urine. The urine earth can be put on the land like ordinary farm yard manure with good effects.

(2) Ground nut husks, which are obtainable in very large quantities in the tracts where ground nuts are grown, are spread six inches deep in the Cattle shed. The dung is removed daily and the ground nut husks stirred up. These are quickly broken up fine by the treading of the cattle and remain sweet for about a month. Then they should be removed and put in the pit along with the dung, and another lot of husks spread in the Cattle shed.

To this we would add a third method for use by Coffee planters. Coffee husk or dry pulp is spread daily on the floor of the Cattle shed and dusted with bone meal. The cattle trample this with their litter and the whole is removed once a fortnight and either applied to the Coffee at once or put in a pit. This is an excellent way of making use of Coffee pulp; the cattle like it and it forms a good manure and is a good absorbent.

The pit into which the manure is put should be water tight and the manure should be occasionally covered with a layer of earth, while ashes, line-sweepings, and refuse generally from the estate yard may be added to it. When it is full, if it is to be stored, it should be covered over, with a foot of earth and protected by a 'pandal from rain and sun. Throughout the material in it should be compacted as firmly and tightly as possible.

It is very important to prevent the rain leaching the manure. When water is allowed to soak through a manure heap and drain away from it, there is carried off in solution and in suspension a certain quantity of organic and inorganic compounds containing nitrogen as urea, other organic nitrogen in small amounts, ammonium salts, and nitrates, some phosphates, and considerable quantities of potash, with other mineral substances of less importance. Protection of manure from rain is therefore most important.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Anamalai Planters' Association.

Proceedings of the Twelfth Annual General Meeting of the Anamalai Planters' Association, held at the Iyerpadi Bungalow, at 10-30 a.m., on Monday, 15th February, 1915.

PRESENT.—Messrs. C. R. T. Congreve (Chairman), G. A. Marsh, J. Hatton Robinson, A. C. Cotton, E. N. House, A. A. Robb, J. Carless, R. Fowke, D. Cooper, J. Pruen, J. O. K. Walsh, and J. E. Scott (Honorary Secretary.)

Minutes of previous Meeting held on 30th November, 1914, confirmed.

Cochin Outlet Road.—Proposed by Mr. Marsh and seconded by Mr. Robinson that this resolution should read as follows :—

"That the Cochin Durbar in conjunction with the Anamalai Planters' Association undertake the survey of proposed road from Cochin Frontier to the District at once and that the Association pay half actual costs."—Carried.

Annual Reports and Accounts. The Honorary Secretary's Report for 1914 :—Mr. Chairman and Gentlemen,—I beg to lay before you my Annual Report for the past year.

1. *Membership.*—We have 12 Estates on the Register.

2. *Meetings.*- Since the last General Meeting, there have been 4 General Meetings and 4 Committee Meetings, all of which have been well attended.

3. *Finance.*—I am extremely sorry there is so little balance at the credit of the General Fund, but I have been unable until now to find time to send out the Accounts for the year, this, however, has been done to-day and subscriptions will no doubt come in at once. There is still a small balance to come in on account of last year.

4. *Planters' Benevolent Fund.*—I trust all our new Members will join this.

5. *Season and Crops.*—The Monsoon has been all that could have been desired from a planting point of view, perhaps a little too heavy for coffee ; there was rain in January which at one time looked as if it would do damage to coming Coffee Crops, but I am glad to say prospects are still fairly bright, provided the present dry weather continues. This year's Coffee Crops have naturally been short after the bumper crops of last year. Tea, I believe, has done exceedingly well and cardamom crops are average.

6. *The acreage under cultivation* is as follows: 11,059 acres.

7. *Labour* has been plentiful of a kind and came in good time. The starting of the Labour Department for South India will undoubtedly be a great boon to us all and we must all thank Messrs. Abbott, Barber and Nicolls for their work in getting this through.

8. *Medical*—I had written a slightly different Report about this, but since writing it, I have been invited by the Collector to attend the laying of the foundation stone of the New Hospital to-morrow by my old and esteemed friend Mr. Marsh. I must say this news came as a pleasant surprise to me as, although I felled the piece the new Hospital is to be built on and am Secretary of the Association, I had no idea that such great strides had been made towards the starting of it. Apparently as the previous Honorary Secretary said it might do -this site has proved the Charm!!!

With regard to the present Hospital, I think most of us have found the present Sub-Assistant Surgeon willing and obliging, although perhaps a little expensive.

9. *Transport.*—The Scheme of the Cochin Western Outlet Road is now before us. That we require another outlet to the District we all know and I sincerely hope we will be able to meet the Cochin Government in this matter

and get the road started. Personally, I think we are in for a very bad time unless something is done at once with regard to this matter.

10. *Post and Telegraph Office.*—I am glad to say this has also made progress and I understand that the Inspector of Post Offices visited the proposed site near the new Hospital site. Whether he approved of this or not I cannot say, no doubt there is another surprise awaiting me. The Telegraph Bond has been registered and sent to the Collector and I hope shortly to hear that the wire has been started from Anamalai village the present terminus.

11. *The War.*—This, of course, has altered many things and the new openings would have been very much larger if it had not broken out. I expect we have all been cutting down all we could and will have to continue doing so for some time. Several members of the Association have left the District to serve in some way and, I am sure, you join me in wishing them every success and a speedy return.

12. *The Accounts* are now on the table and I shall be glad if you will pass them and accept my resignation. I regret very much indeed not having been able to do more for the Association and as you all know I resigned some time ago as I found I could not possibly devote sufficient time to the work which had to be done. I have to thank the Chairman and the Committee for the very great consideration they have shown to me during the term of my office.

The Chairman's Address—Gentlemen,—In August last, when war broke out in Europe, at first it looked as if there would be a serious crisis in the planting industries, and it was considered so important that a special meeting was held in Madras. Luckily Government and the Banks came to our assistance and I think the thanks of the planting industry are due to them for their help.

During the past year the Labour Department has been started, and I am glad to say this district has, without exception, joined. Although we cannot expect too much from it to begin with, I feel sure we shall find the Department of the very greatest benefit to us all before long.

Township.—It is distinctly a step in the right direction that the hospital buildings have actually been started at last, and I trust these buildings will only be the prelude to a large and flourishing township in our midst, and that the Post and Telegraph offices, Chattram, Travellers' Bungalow, Club and Bazaar will shortly follow.

Transport.—As you are aware the Cochin Government approached us a short time ago, suggesting the possibility of coming to some agreement to enable them to make an outlet from our district *via* Perambukulam, and to make use of their forest tramway. The matter is not yet settled, but I have every hope that it will be found possible to put the scheme through, and that the Cochin and British Governments will be able to come to some agreement, about cutting the road from the district to Tram head.

I think there can be no two opinions that our present road will shortly be inadequate for the largely increasing traffic, unless it can be altered to allow of the passage of motor trollies, and I understand the cost of this would be very large. The Rope Way Scheme also has the draw back of being very costly, and I think everything points to the Cochin outlet as being the best for all purposes.

Liquor shops.—This subject is again before the Association for discussion. I think that it will be a great pity if something cannot be settled, and I would suggest that a central shop in the township be started.

Minor Forest Produce.—As you are all aware the Minor Forest Produce was run by a separate Department up to last June when it was handed over to the Association. All the gentlemen appointed as Collectors

were new to the work and must have found the work difficult at first but I feel sure their report will be found satisfactory.

I have to thank the Honorary Secretary for the very able way in which he has conducted the affairs of our Association during the past year. He has left practically nothing for me to do. I also wish to thank the members of the Committee for their unfailing help in all matters. I now place my resignation in your hands.

Proposed by Mr. Marsh and seconded by Mr. Robinson and carried: "That the Honorary Secretary's Report be adopted and printed with the Proceedings of the Meeting. Mr. A. C. Cotton was appointed to audit the accounts which were found correct."

Proposed by Mr. Scott and seconded by Mr. Robinson: "That the Honorary Secretary write to the Postmaster-General asking for a definite reply as to whether they will provide the money for the building of the new Post and Telegraph Office this season, in the event of their refusal whether they will allow this Association to provide the necessary funds for the D. P. W. to erect the building at once, provided always, that the Post Office guarantees 8% (eight) on the Capital and agrees to take over the building and pay for same at cost price in 1916."—Carried unanimously.

Proposed by Mr. Cotton and seconded by Mr. Fowke: "That this Association thanks the Superintendent of Post Offices for transferring the late Post Master and wishes to record with satisfaction the behaviour of the present man and hopes he may be confirmed permanently."—Carried.

Liquor Shops.—Proposed by Mr. Congreve and seconded by Mr. Carless.—"That the Abkari Department be informed that at present the Planters are not in favour of opening Arrack Shops, but would suggest that arrangements be made to supply planters with arrack for their coolies for feasts, etc., at wholesale rates."—Carried.

Demarcation Stones.—The Honorary Secretary was requested to write again to the District Forest Officer and ask him for a reply to his letter asking him "What would be done for Rs.200." On receipt of this information other Estates would probably come in.

U. P. A. S. I. Representative on the Indian Tea Association.—The Honorary Secretary was requested to write with regard to this and to inform the U. P. A. S. I. that this Association proposed that the Hon'ble Mr. E. F. Barber be appointed.

Cochin Outlet Road.—Proposed by Mr. Robinson and seconded by Mr. Marsh "That the Chairman in conjunction with the Honorary Secretary write to the Cochin Durbar giving details of Tolls collected on that Ghat Road during the past year—and pointing out that the traffic at present is nothing in comparison to what it will be in two year's time, and that under the circumstances it is hardly necessary to ask for a guarantee and that it has already been pointed out that the majority of the traffic will be diverted to the proposed Western Outlet—and that the Association will be glad to have the Durbar's immediate views on the question."—Carried unanimously.

Minor Forest Produce.—This was dicussed at length.

Election of Office Bearers.—The following gentlemen were elected as Office Bearers for 1914:—

Chairman	...	Mr. C. R. T. Congreve.
Vice-Chairman	...	,, J. Hatton Robinson.
Honorary Secretary	...	,, A. C. Cotton.

Committee.—Messrs. E. W. Simcock, A. A. Robb, R. Fowke, B. M. Behr, and J. E. Scott.

(Signed) C. R. T. CONGREVE, *Chairman.*
(,,) J. E. SCOTT, *Honorary Secretary.*

FERTILISERS.

The Duration of the Action of Fertilisers.

In the *Journal of the Royal Agricultural Society* Mr. A. D. Hall describes some experiments carried out at Rothamsted since 1904 to determine the duration in the soil of the effects of different fertilisers. The results are of great interest and help to throw light on manurial problems in this country also.

Cake fed Cattle manure showed a great superiority over root and hay fed Cattle manure in the year of application. The effect of the manure lasted in both cases for four years and the superiority gradually decreased till in the fourth year they were of equal value. This is due to the fact that both contain the same amount of insoluble Nitrogen, but the cake fed manure is richer in available plant food, ammonia and amides, the effect of which quickly disappears.

Shoddy proved to be a persistant manure which exerts in the first year of its application less than one half its total effect. It evidently contains compounds of Nitrogen subject to comparatively slow decay, and its effect in the fourth year is still considerable. In the same category should be included all manures made from hair, fur, skin, silk, hoofs, horns, etc., and probably also the Nitrogen compounds of bones.

Peruvian guano and Rape cake, on the other hand, are active Nitrogenous fertilisers, giving a high return in the year of application, but they leave no residue possessing any value for succeeding crops, or in succeding years. The nitrogenous compounds in the guano are ammonium compounds, uric acid, and its derivatives, and some proteins; in the rape cake almost entirely proteins. Hence it may be concluded that protein Nitrogen is as active and as temporary in its action as ammonium compounds. This is quite to be expected, for proteins are readily and completely digestible and equally easily attacked by bacteria, and pass into ammonia and kindred bodies with great rapidity. Proteins therefore must be classed with nitrate ammonia, urea, etc., compounds which produce all their effect in the year of application, and leave little appreciable residue behind, and are in contrast to the collagens (the insoluble nitrogenous compounds of wool, skin, bone, etc.) and the indigestible residues of food.

With this distinction in mind the residual value of the Nitrogen of other fertilisers can be roughly estimated. In poonacs it will be present in the form of protein, in fish it will be mainly protein, in meat guanos protein and collagen, the latter predominating the poorer the manure is and the more it approximates to bone meal. Hence we may conclude that poonacs and fish are rapidly effective and not lasting while meat guanos and bone meal are more slowly available and more lasting in their effect. This applies to their Nitrogen content only and not to the phosphate they contain.

In the case of phosphatic fertilisers, the experiments showed that they persist in the soil and the residues exert an effect roughly proportional to the amount of phosphate unused and that superphosphate is as lasting a manure as either bone meal or Basic slag.

The conclusions outlined above are based on experiments on the Rothamsted soil only, In the case of Indian soils and conditions no doubt they may need a certain amount of modification, but this applies more to the results with phosphatic fertilisers than with nitrogenous fertilisers.

R. D. A.

RUBBER.

The Batavia Rubber Congress.

The India Rubber World publishes the following summary of the papers read at the International Rubber Congress held at Batavia in October, 1914 :—

One of the most original and interesting of these papers is that of W. J. Gallagher, on 'The Significance of Branching in Young *Hevea* Trees.' Everybody knows that a tree or plant deprived of its proper amount of light will grow spindly, lifting its head ever higher, while the stalk is thin and weak. In the rubber tree it is evident that a thin stalk means a low bark area and a lessening of the latex producing cells. Mr, Gallagher takes the very practical view that no amount of sunlight is going to do the tree much good unless there are leaves to receive and utilise that light, in turning the crude sap into plant building material. To get a large leaf area there must be branches, and a young tree growing upward without branches is, though growing in the open, much in the same condition as if it were growing in a thicket. This is theory. A test was made in a field containing a number of branched and unbranched trees 2½ years old. The former showed a uniformly better girth. A later measurement showed a growth of girth in the branched trees of 3.2 centimeters, while the unbranched showed a gain of less than one centimeter. Branching having been induced later on the unbranched trees, they showed an actually greater rate of growth than the naturally branched trees. Other experiments confirmed the theory and showed, among other things, that the difference in branches and leaves had more effect on growth than the use or lack of manure.

As to methods of inducing branching, topping will at once suggest itself, but Mr. Gallagher points out that this plan has serious objection. His plan is stripping the young tree of its leaves—not by picking, but by cutting—leaving the petiole attached to the tree. In a few days this drops off and a young branch develops in the leaf scar, the result being a fine, well-balanced head. He does not believe in excessive pruning, but thinks the branches settle the question themselves in the survival of the fittest. He thinks branches should be allowed from 7 feet upward. There is no light gained for the leaves by stilting the crown a few feet. He says if the time comes that the plantation as a whole needs light the remedy is not to cut out branches but trees.

Mr. Gallagher says: 'Topping should be done, if done at all, before the trees are two years old. The top should be cut off with a sloping cut, which should be immediately tarred. The cut should be made in the uppermost whorls of leaf traces, and not necessarily at ten feet high, but in the best place nearest to ten feet.

This brings us to the subject of thinning, which is considered in a paper by Mr. E. B. Skinner. In the matter of close planting the experience of the rubber grower is not analagous to that of the northern fruit grower, a fact which had to be learned by hard experience. With the latter the produce of the young trees is as good as the old and the whole field may be swept clear at comparatively low cost. But with rubber, immediate returns are the least and, as the planting is for not less than a lifetime, the future of the big trees is the first consideration. Careful experiment shows conclusively that the yield, pound for pound, is better on widely planted than on closely planted equal areas, and of this, according to Mr. Skinner, at

least 10 per cent. more is No. 1 rubber. In addition, he shows conclusively, meeting arguments to the contrary, that the cost of harvesting per acre is less with wide than with close plantings. In the beginning Mr. Skinner would plant about 100 trees per acre, and these he would reduce, not by cutting out rows, but by selection for elimination of the least shapely or thrifty, and after bearing has begun, of the least productive trees. Always he would have the end in view that the remaining trees must have all the light and air they need. When the elimination of a tree is decided upon he would have it out and done with. The system of pollarding or cutting away the top and tapping the dying stump, he says, does not pay for the labour and nuisance entailed.

The tempting subject of catch crops is considered in several papers, and while all seem to wish it were possible to realise a good revenue from the ground on which the young rubber trees are maturing, not one is able to suggest any crop or plan which makes any sure promise of profit.

"Methods of Coagulation and Preparation of Plantation Rubber" is a paper which cannot fail to interest the rubber man in the market place. It is by B. J. Eaton, Government Agricultural Chemist of the Federated Malay States. After stating that the coagulant used on at least 99 per cent. of the estates is acetic acid, he proceeds to lower the colors of those who criticise acetic acid as a 'chemical' by informing them that it is acetic acid in the smoke of the Brazilian native gatherer which produces the admirable results in coagulation to which the critics have been pointing. It the use of this acid care must be exercised; like soda in the biscuit, there must be neither too little nor too much. Too concentrated a solution forms clots, too dilute will not work at all. It is possible to use sulphuric acid, but its less cost is not held to warrant the risk its use involves. The latex is coagulated 40 or 50 gallons at a time, and after four hours is removed from the pans, The coagulum is then passed between rollers to expel the greater part of the moisture, placed in racks to drain and the sheets are removed to the drying room the same evening. The smudge is usually made of cocoanut husks with the additton of indifferent woods and continues 10 to 14 days, or slightly longer.

The subject of smoking and its effects are considered in the foregoing paper, and also in one by G. Stafford Whitby, Probably there are very few who do not believe that the dark colour of rubber is due to the particles of carbon from the smoke. That this is not true may be seen at once in the fact that the rubber when it leaves the Amazonian fire is still nearly white and that it darkens afterwards. It is now practically certain that the darkening is caused by an oxidising enzyme present in the latex and its action on certain oxidisable substances naturally present in the latex, but which may be added to by the smoke. The addition of sodium bisulphite to the latex neutralises this enzyme, with the result of a very pale rubber. Mr. Whitby thinks that smoked rubber is undoubtedly preferable to unsmoked and attributes it in part at least to the warmth of the heavy smoke.

Some of Mr. Whitby's remarks might be summarized by saying that rubber is rubber. He says that colour is no indication of quality; that there is little or no relation between the tensile properties of raw rubber and the same rubber in a vulcanised state; that the defects of appearance arising from various causes and known as oversmoking have nothing to do with quality, and that the same is true of the appearance of small bubbles in the sheet.

INDUSTRY AND COMMERCE.

Education in Relation to Industry and Commerce.

Concluded.

Commercial Army Necessary.

It is not sufficient to have a well-equipped industrial army; there must be markets for the products of industry. The goods produced must be sold, and we must have, a commercial army as well trained and equipped for the work of distribution as the industrial army is for the work of production.

It has often been stated that England is deficient in what is usually called technical education, but we must frankly acknowledge that she is infinitely worse off in regard to commercial education in spite of the development of this type of education during recent years.

The United Kingdom still ranks first among the commercial countries of the world, with its enormous annual imports and exports, its immense home trade, and its great shipping trade. We not only carry the whole of our own commodities, but we do an enormous amount of carrying for other countries. In view of these facts it is strange that commercial education should have been so strangely neglected in England. Travellers agents, and Consuls representing the interests of British trade abroad are generally foreigners who have been thoroughly trained in the practice and theory of business while at home. The majority of our foreign correspondents and managers of firms with branches abroad are likewise foreigners. For years we have been giving the foreigners a practical experience and knowledge of our manufactures and methods of business which qualify them to meet us as strong competitors. These foreigners come in large numbers; they very often enter our business houses with a view of acquiring information as to the inner working of the firm's business connections, and on going back to their own country they join a rival establishment or set up an establishment of their own.

English firms are driven to the employment of foreigners because young men in England do not pay sufficient attention to commercial education and to the study of foreign languages.

The Training of a Commercial Army.

This state of affairs cannot be allowed to continue. We must produce an army of trained traders, and in the production of this army education must play a prominent part.

The first essential for one who is to enter a commercial career is a sound general education in which the study of English and at least one foreign modern language should be of first importance. Any intending business man should have a secondary-school education and specialised commercial study should not be commenced until the age of fifteen at least. In many good secondary schools commercial sides are organised for the higher forms, and the studies of the pupils are given a certain amount of commercial bias.

The commercial education so given is strikingly inadequate in comparison with the provision in other countries. Unfortunately we in England still retain the idea that a small amount of education is sufficient for a man destined to be a trader, whereas other countries are more enlightened, and they endeavour to provide for the future trader the highest education applicable to his walk in life.

Schools for Commercial Education.

England in this matter has delayed far too long. It is now essential that there should be established in this country schools of commerce which in our English system might well form one side of our secondary schools, with a curriculum specially designed for the higher education of young people who are destined for a business career. The teaching staff must be really competent and the school must be equipped for teaching the theory of business, and as much of the practice of business as possible, the general aim of the school being to train well-equipped employees of all grades from the competent clerk to the competent employer.

A Typical School of Commerce.

Belgium was the first nation to give practical effect to the idea of establishing a special college for the commercial training of her young men. The aim of the exhibition held at the Crystal Palace in 1851 was to compare the progress made by the different peoples in the development of the industrial arts. It was recognised that England held the first place. But while we rested complacently on our oars, other nations profited by the lesson and began to take steps to promote their home and foreign trade. Belgium recognised that competent men to represent her in the foreign markets were required, and as a result the Higher Commercial Institute at Antwerp came into existence. It was to be to the men destined for a commercial career what the university was to the doctor or the lawyer. Similar institutions have since been founded in France, Switzerland, Germany, Austria, Italy, and even in distant Japan. Before admission candidates must show competent knowledge as tested by an entrance examination. The curriculum embraces the study of all subjects, a knowledge of which is indispensable to the merchant, the banker or the trader, including at least two foreign languages, book-keeping, commercial documents, geography, history, arithmetic, and algebra, commercial law, and the elements of political economy, as well as physics and chemistry. The course of study is practical as well as theoretical. Transactions of a large commercial house are simulated, the operations of a counting house are minutely practised and all questions relating to the theory of exchanges are carefully described. Correspondence is conducted by the student in French, German, and English. The principles of international commercial law and customs' legislation are inculcated, and special care is taken to make the student acquainted with foreign markets by furnishing him with reports sent in periodically by Belgians resident abroad. To further the knowledge of all kinds of vegetable, mineral and animal products, there is a well-furnished museum with samples and patterns kept up to date, so that the professor is able to give to his pupils a direct knowledge of the article, in which the latter may one day be called upon to trade. The actual political and economical condition of foreign countries is studied from carefully compiled data and the relative value of raw material from different sources of supply is inquired into and noted. The student is encouraged to take a close interest in the political events of to-day so far as they affect commercial interests, and the latest consular reports from all countries are placed at his disposal, so that he himself later on may be in a position to make a report upon the commercial practice of any country in which he may happen to find himself. Visits to factories, mills, mines, etc., enable the student to acquire an insight into the actual working of those industrial establishments.

Valuable travelling scholarships are given to the best students, who are thus relieved of the necessity of accepting the first situation that is offered

to him. He is enabled, in fact, to study the economical condition of the country in which he resides, but he must send home periodically a detailed report of the result of his observations. These reports, after being noted by the Government, are utilised by the students in the prosecution of their studies.

Training of Clerks.

For those engaged in business who are not able to attend full time at a day school of commerce, arrangements should be made by which they should be able to attend such schools on three or four half-days a week during the normal working hours. The young worker in a house of business is in the same difficulty as the young industrial worker: he cannot get an all-round training: and at present he must get his theoretical knowledge of commerce by attendance at a commercial evening school on three evenings a week. This system is unsatisfactory: but by a part-time attendance at a day school of commerce, he might go through a modified course of instruction which combined with his experience in a business house should make him far better fitted for the post he is filling.

Training for the Consular Service.

In the school for commerce the highest courses are arranged for the special purpose of fitting the student for the Consular Service. At the present time England is generally represented abroad by a foreigner whose first interests naturally are not British. What we require is that every Consul representing British interests should be an Englishman specially trained for the service, with a full knowledge of British trade, and ready and able to place British interest first.

A Liberal Education Necessary.

Our travellers, managers, agents, and responsible clerks in connection with all branches of industry should be properly trained. They should complete a course of study applicable to their particular calling, including modern languages for commercial purposes, commercial arithmetic, book-keeping, and accounts, commercial practice, geography and history of commerce, economics and commercial law. At the same time it cannot be too strongly urged that opportunities must be provided for education apart from the purely utilitarian form.

The period between fourteen and eighteen years of age is a vital period during which the youth should have the opportunity of fitting himself for livelihood and for life. He should have the opportunity of learning in the fullest sense his trade or business and of developing those faculties of mind, body, and spirit that would enable him to fulfil his duties to his neighbours and to the nation. The school course should, therefore, offer beyond the purely technical or commercial subjects other subjects of a liberal character. The youth is not merely a wage-earning industrial or commercial; he is a human being, and his education and training should enable him to occupy his leisure time to good advantage.

Responsibility of Education Officials.

A responsibility rests upon us as education officials. It is for us to see that the educational needs of the nation are really appreciated, and that the fullest educational opportunities are provided for all. If we rightly do our part there should arise in England an industrial army and a commercial army capable of maintaining for our country that industrial and commercial supremacy which is vital to a nation so situated as we are.—*Nature*.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 14.] APRIL 3, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED)

Contents.

We publish for information the recommendations of the Rubber Growers' Association for the treatment of latex and Curing of Rubber.

Under the heading of "Taking Pains," we publish a little sermon by Dr. T. N. Carver, the Advisor in Agricultural Economics to the U. S. Department of Agriculture.

The *Queensland Agricultural Journal* furnishes us with an account of the experience of Mr. S. Stirling, in the use of gelignite for blowing out stumps, and we wish that some one who had experimented with that or any other explosive, whether for opening up new land or growing crops, would supply us with their experience. One gentleman about a year ago experimented with an explosive in growing tea and promised to furnish us with a report, but this must be held in abeyance as he has answered to the call to arms and has joined the Indian Army Reserve of Officers.

We publish some official statistics of the Coffee trade in the United Kingdom taken from the *Produce Markets' Review*, from which paper we also publish a paragraph dealing with Indian Tea and the official statistics of the Tea trade of the United Kingdom.

The treatment of Rinderpest which is so prevalent is referred to.

The Director of the Labour Department writes to us as follows :—

"A curious case which is of general interest. In a certain district a "criminal warrant and a civil process were out against the same man, a "defaulter of an Estate subscribing to the Labour Department. The criminal "one was served but the civil one was returned with the endorsement that "the man was not to be found. The matter is, of course, being reported to "the proper authorities.

The proceedings of the Annual General Meeting of the South Mysore Planters' Association held at Mudigere have not yet reached us, but we hear that the following gentlemen have been elected :—

Mr. M. J. Woodbridge	..	President.
Mr. C. Lake	...	Vice- President.
Mr. A. Thomson	...	Honorary Secretary.

RUBBER.

R. G. A. Recommendations for the Treatment of Latex and Curing of Rubber.

APPENDIX B.

The following recommendations for the treatment of latex and curing of rubber have been compiled by the Uniformity Committee of the Rubber Growers' Association from information supplied by the Scientific Staff, and appear as " Appendix B" in the annual report of that body.

GENERAL.

1. Cups, Buckets, and other Utensils should be selected with a view to ease in cleaning and should be kept absolutely clean. Vessels made of copper, or any alloy of copper, and kerosene tins or receptacles with similar angles should be avoided.

2. *Water in Cups.*—In most cases addition of water is quite unnecessary. A little clean water may be used in very dry weather, when the latex tends to coagulate very quickly. In some instances a little formalin or sodium sulphite (*not* bisulphite) may be added, *but application should be first made to the laboratory for advice before using these reagents.*

3. *Water on the Transverse Cuts is not advisable.*—Often the latex coagulates as a result of employing water on fresh cuts.

4. Bark Shavings and other impurities should not be allowed in the cups or buckets.

5. *Collection of Latex.*—Latex should not be allowed to stand in the field. The earliest opportunity for collection should be taken. It is recommended that in collecting the following grades be recognised and kept separate :—

(*a*) Clean uncoagulated latex. (*b*) Lump, coagulated in the cups. (*c*) Rinsings from the cups.

6. *Transport of Latex.*—Every possible means of facilitating quick transport should be taken. When distance of transport is great, outstation coagulating houses should be erected.

In the Factory.

RECEPTION OF LATEX.

7. *Preliminary Treatment.*—The latex should be received if possibly on a verandah, so that there is no necessity for coolies to enter the building, thus avoiding the presence of dirt in the factory.

8. *Supervision.*—The reception of latex should be under direct European supervision. Causes of defects in preparation of the finished rubber are thus often detected.

9, Cleanliness in utensils and methods is absolutely necessary ; any neglect in this repect is sure to detract from the quality of the rubber.

10. Straining ot Latex should be thorough, care being taken to see that the mesh is in good order.

11. *Bulking of Latex is strongly recommended.*—The mixing of all latex undoubtedly tends to produce a rubber of greater uniformity.

12. *Sodium Bisulphite.*—For crepe manufacture dissolve ½lb. of the powder in 1 gallon of water. This will be sufficient for 40 gallons of undiluted latex. The solution should be well stirred in after bulking and before the addition of acid. Larger quantities of sodium bisulphite are quite unnecessary. Sodium bisulphite should not be used in making sheet rubber.

Note.—Latex containing more than 35 per cent. of rubber may be taken as "undiluted latex."

COAGULATION.

13. *Coagulant.*—Acetic acid is recommended as the best coagulant at present.

14. *Strength of Solution.*—Stock solutions should be made up as follows:—

(*a*) *For making Crepe.*—Take one part of concentrated acetic acid, of 98 to 100 per cent. strength, and dilute it with 20 parts of pure water.

(*b*) *For making Sheet.*—Take one part of concentrated acid, of 98 to 100 per cent. strength, and dilute it with 200 parts of pure water.

If in making these stock solutions a more diluted acid be employed such as an acid of 80 per cent. strength, a proportionately greater amount of acid must be taken; thus with an 80 per cent. acid, 1¼ parts must be taken instead of one part.

In effecting coagulation the maximum amounts of these stock solutions, which need never be exceeeded, are:—

(*a*) *For Crepe.*—1 part of stock solution to 50 parts of undiluted latex;

(*b*) *For Sheet.*—1 part of stock solution to 5 parts of undiluted latex.

It will frequently be found that less than these amounts is enough to produce complete coagulation, and the minimum amount which is effective should be ascertained by trial.

If the latex has been diluted, a proportionate reduction in the amount of the coagulant may be made: thus if 50 gallons of pure latex have been diluted up to 100 gallons by adding water, then only one part of stock solution (*a*) need be used for 190 parts of such diluted latex.

15. Mixing of acid and latex should be thorough. This is best effected by means of broad wooden paddles. Sticks must not be allowed for this purpose. When making sheet the scum should be removed and added to the lumps:

(*a*) For the preparation of crepe rubber or sheet rubber in coagulating tanks any quantity of latex may be coagulated in bulk;

(*b*) For sheet rubber, when ordinary dishes are used, not more than 50 gallons of latex should be treated with acid in one batch, as the latex sometimes coagulates before all can be poured into the dishes. It is sometimes expedient to add water to the latex or to use a diluted solution of formalin to prevent rapid coagulation. *In such cases advice should be obtained from the laboratory.*

PREPARATION OF RUBBER.

16. *Amount of Working.*—The extent to which rubber is worked on the machines should be the minimum found necessary.

17. The Thickness of the Rubber determines the rate of drying. Pale crepe should be rolled out thin for drying, especially thin for artificial drying, and this can subsequently be worked into blanket crepe if desired. Sheet rubber when dry should not exceed $\frac{1}{8}$ inch in thickness.

18. *Smoke Curing.*—Sheet should always be as uniform in thickness as possible, and the period of smoke curing should also be uniform. Sheets not exceeding $\frac{1}{8}$ inch in thickness should usually dry in 9 to 10 days.

Note.—The best temperature for smoking is 120 degrees to 130 degrees F.

19. *Defects.*—

CREPE.

Defects to be avoided.	*Preventatives.*
(1) Oil Streaks	... See that oil from the bearings does not get on to the rubber— (*a*) through use of too much lubricating oil; (*b*) through worn bearings. These should immediately be replaced, as oil from worn bearings contains particles of copper or verdigris, which gradually eat into the rubber and reduce it to the consistency of treacle. (*c*) by taking care that the crepe does not come near the edge of the rolls or other parts of the machinery, which may be oily. Trays under the washing mills should not project beyond the ends of the rolls.
(2) Dark Streaks	... Avoid oxidation and surface darkening of portions of the coagulatad latex by the use of a little sodium bisulphite in the latex (for proportion, see paragraph 12 above). Do not allow the rollers to grind against each other.
(3) Mottling, Spots and Discoloration	... Keep the crepe thin and do not hang it too closely in the store so that the rubber dries quickly. In case of persistent spot trouble, apply to the laboratory.
(4) Mouldiness	... Proceed as in (3) and see that the rubber is thoroughly dry before packing.
(5) Cotton Fluff	... Do not use cotton waste for keeping the oil off the rolls. If a pad is necessary, use one of cloth or flannel. Avoid using too much oil.
(6) Tackiness, (Heat and Stickiness)	... See that rubber is not exposed to direct rays of the sun. Scrap should be brought in and washed as soon as possible—if there is unavoidable delay in washing, the scrap should be kept in water.

SMOKED SHEET.

(7) Mouldiness ... Efficient smoking (see also under 8).

(8) Rust (Stretching Rusty, Resinous, or Opaque)... The sheet should be scrubbed down with a stiff brush and plenty of water a few hours after rolling, allowed to drip for one hour, and then put into the smokehouse.

If the latex is very rich, dilution with water before coagulation to a proportion of 1½ to 2 lbs. of dry rubber to the gallon is recommended.

(9) Over Smoking (Dark, Glossy Surface) ... This may be caused by the use of too large a proportion of coconut husks, rubber seed, or similar oily material. The timber used should not be wet and the fires must not be allowed to burst into flame. Do not use coconut oil for smoking.

(10) Tar Deposits ... See that the roof of the smokehouse does not drip owing to condensation.

(11) Thickened Edges ... Take care that the edges are not doubled over in rolling, as this gives sheets of an uneven thickness and liable to cut virgin.

CARE OF MACHINERY.

20. Machines must be well cleaned and inspected each day before commencing work. At frequent intervals (say, once a week), they should be well cleansed of all traces of oil by means of a 5 per cent. solution of caustic soda. This must be applied under European supervision, by means of a cloth fastened to the end of a stick. Afterwards the machines should be set in motion, and the water allowed to run for some time, say ten minutes.

21. *Lubrication.*—The engine driver, or other responsible person, should do this work.

22. Worn Parts must be replaced at once. Worn bearings are often the cause of "green streaks" in crepe rubber. When the grooves of rolls have become worn they cease to grip the rubber, thereby reducing the output of the machine and overworking the rubber.

SORTING AND GRADING.

23. Great attention and careful supervision are necessary for these operations. The fewer grades the better, and the regularity of each grade is most important.

The perfect assortment should consist of:—

No. 1.—Fine sheet or fine crepe, made from the free or liquid latex.

No. 2.—Clean light brown crepe, made from lumps, which cannot go through the strainer, and skimmings.

No. 3.—Scrap crepe made from tree scrap.

No. 4.—Dark crepe, made from bark shavings and the lower quality of scrap crepe. Earth rubber and any tacky rubber should be packed separately.

Colour.—Evenness is most desirable and any discoloured or mottled pieces must not be left in the first quality.

In No. 2 clean brown crepe, no grit or minute pieces of bark should be left in the rubber.

All pieces of scrap showing the slightest traces of heat must be picked out.

The crepe usually known on the market as "specky brown" is often insufficiently washed; bark or other impurities left in the rubber reduces the value.

No. 4, the lowest grade, naturally varies very much and special attention to washing is most advisable.

Smoked sheets should only be of one quality. Any sheets oversmoked or showing imperfections should be packed separately.

Packing.—Opinions differ as to the suitability of cases employed, but there is no doubt that the wood must be planed, so that no splinters can get into the rubber.

As a general rule, the three-ply wood cases specially made for rubber are the most desirable. Care should be taken to see that the inside of the package is thoroughly clean before packing.

19 by 19 by 24 inches measurement and capable of holding up to about 200 lb. is recommended for sheet.

21 by 21 by 24 inches measurement and capable of holding up to about 155 lb. is recommended for crepe.

Other cases, which have proved satisfactory, are the Japanese Momi and the Cochin case. Ordinary (local) native made chests are undersirable. Rubber should never be packed in bales.

N.B.—Consumers' worst enemy in rubber is heat and stickiness, a very little of which will often spoil an otherwise good parcel.—*The India Rubber Journal.*

Precautionary Measures against the Spread of Plant Diseases.

In referring to the discussions on cacao cultivation which took place at the Third International Congress of Tropical Agriculture, *Tropical Life* takes occasion to make some remarks on the subject of legislation against plant diseases and pests. The writer considers that certificates as to the freedom of plants from diseases or pests are only of value when officially issued at the *importing* centres known to be infected ought to be placed under quarantine, and exports of plants or seeds prohibited from such centres, until the cause of the quarantine ceases to exist. Some such regulations are already in force, and are likely to be made more stringent. The question then naturally arises—How are planters to make and keep their properties a clean centre of export? It is suggested that definite areas of not more than 300 to 500 acres should have isolating belts, preferably a practically bare strip of land like a road, right round them. Such a precaution would enable the careful planter to control a disease or pest more easily, and it would tend to prevent its spreading far and wide. Even when the most stringent measures had to be applied, such as burning out, they could be more effectually and economically carried out in such limited areas.—*The Agricultural News.*

TAKING PAINS

The following interesting little sermon is by Dr. T. N. Carver, the Adviser in Agricultural Economics to the U. S. Department of Agriculture and appeared in *Farmers' Bulletin* No. 629 of 1914. As advice to Indian planters it would appear to touch home in some places:—

"There is a story of an aged savage who, after having lived in civilised communities most of his life, returned in his old age to his native tribe, saying that he had tried civilization for 40 years and it wasn't worth the trouble. Much of the philosophy of civilization is summed up in that remark. Civilization consists largely in taking trouble. Genius, in the individual, has been said to consist in the capacity for taking infinite pains in one's work. It is this capacity which marks the superior race as well as the superior individual. They who find the taking of pains too burdensome to be borne, will naturally decide that civilization is not worth the trouble. They who do not find it so very burdensome to take pains, will naturally decide that civilization is worth the trouble, and will therefore become civilized.

"This principle applies to every stage of civilization and progress. The greatest advancement is made by those who are capable of taking greatest pains. It applies especially to agricultural progress. It is more trouble to select than not to select seed, and to select it in the field than in the bin. It is more trouble to test cows than not to test them, to keep accounts than not to keep them, to diversify or rotate crops than not to diversify or rotate, to mix fertilisers intelligently than to buy them already mixed, to co-operate with one's pig-headed neighbours, especially if one is himself a little pig-headed, than to go it alone. It is also more profitable. In all these and a multitude of other cases it is found that it pays to take trouble.

"There is probably no part of the farmer's business where this needs to be so much emphasised as in his buying and selling. It is so much less trouble to buy all one's supplies at retail as they are needed than to plan ahead and buy at wholesale, and to sell one's products at wholesale and in bulk to the nearest buyer than to work out a better marketing scheme, than this practice of buying everything universal. It takes a very rich soil, or very hard work on the farmer's part, or both, to make up the losses resulting from this system. The farmer is becoming, almost in the same sense as the manufacturer, a buyer of raw material such as fertilisers, seeds, feeds, machinery, live stock, etc. What manufacturer would expect to prosper if he depended upon the retail stores to supply him with his raw materials as they were needed and at retail prices? How many manufacturers would expect to prosper if they did not have selling agencies but waited for buyers to come around and offer to buy their products after they were finished?

"Of almost equal importance is the question of making the farm garden, poultry yard, orchard, and dairy support the farmer's family. All these things require the taking of trouble. It is less trouble to put all one's time on a money crop, to haul it to town and sell it, and to haul home from the store everything which the family consumes than to give attention to gardens, fruits, poultry, pigs, and cows. It is also less profitable. The products which the farmer's family consumes are sold to the best market in the world. The farmer should credit to the garden, the orchard, the poultry yard, the cow, and the pig-pen the retail prices which he would otherwise pay for food, not half so good, bought at retail.

"Needless to say, these things must be carefully planned and managed. That requires the taking of trouble. Farmers who are not competent, or

willing, to take pains in planning and managing these parts of their business will probably do quite as well by going on the old way of hauling all their stuff to market and hauling home again the goods which the family consumes. But their lack of prosperity will be due to the fact that, like the aged savage already referred to, they have concluded that civilization and progress are not worth the trouble.

"But after all, when one gets accustomed to taking pains it ceases to be painful to keep on. It is only the beginning from which we shrink. When one gets into the habit of keeping accounts, of rotating and diversifying crops, of making the farm feed the family, and running co-operative enterprises, it is not half as much trouble as it was feared that it would be. The real test of a man's quality is his ability to begin taking pains."

Explosive on the Land.

Mr, S. Stirling, ot Mount Morgan, writing of his experience in the use of gelignite for blowing out stumps, says:—

"Having read a good deal in the Journal about clearing land, I give my experience with gelignite. Having some land which at one time teamsters used for a road, and was very hard, I decided to clear it of stumps, so I got a grubber and started digging. It took me two hours to get one stump out, so I decided to try gelignite. I can do more in two shots than I could in two days' work at grubbing, and those two shots would take me twenty minutes to bore, charges and fire for very large stumps. To save gelignite, I blow the earth out from both sides, using two plugs for each side. The stump is generally cleared of earth to a depth of 3 ft., and very often so shattered as to be all ready to set fire to: the small stumps I have blown out with from one to three plugs of gelignite, thus getting rid of small stumps and saving very often ten plugs of gelignite, which would be required if the large stumps were blown out, and bringing the cost of clearing down very low, and, what is more, saving a lot of hard work at grubbing.

"For boring I use a 1-inch auger, 3 feet long, with a brace at end for boring rapidly. I generally bore to a depth ot 18 in, and very often only 12 in. for small stumps—under the stump, if possible; if not, then close to it. After boring out I ram the bottom of the hole firmly with a round wooden banister I use for a tamping rod. Then, if I decide to use three plugs, I break each plug in half, then press each half firmly until squashed solidly in the bottom of the hole. In the last half plug I place the cap with about 12 or 18 in. of fuse, according to the depth of the hole. I then drop in fine earth, a little at a time, and press that down very gently until the hole is filled up. I next split the fuse, and place a little gelignite in the split and light it. It is wonderful how quickly and easily stumps can be blown out, and how quickly ground, even with green timber on it, is got ready for cultivation with no exhausting work.

"Let anyone in doubt take on grubbing for one day; then shoot out stumps next day. He will see the difference between hard work one day and a week's work done on the next day with gelignite by just boring a few holes and charging and firing."

Many people are afraid of explosives, but they are not half as dangerous providing care is taken, as some think.—*Queensland Agricultural Journal.*

COFFEE.

The small increase in the World's visible supply cannot have any effect upon the markets, for the figures are largely dependent upon estimates, as it is not possible to obtain reliable information from four of the principal European ports. Business continues in much the same slack condition; there is a fair demand, but the outlet is still limited, and the supplies are short with not much variety. It is satisfactory to note even a small improvement in the home consumption for January, especially as last year was rather a large increase over the previous year. Possibly, some of this is due to the large number of Belgian and French people living here, and the grocers will, no doubt, spare no effort to secure this extra trade. It is reported that Messrs. Elder, Depster & Co., have withdrawn all their boats from the Costa Rica trade; if this be so, it will mean a serious delay in shipping the new crop and it is said that at present there is very little on the way.

LONDON COFFEE RETURNS.

	Home* Consumption.		Export.		Stock.	
	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.
For week ended February 6 ...	501	341	384	262	15,220	12,745
For 6 weeks ended February 6 ...	1,807	1,374	1,753	1,351	—	—

* The Home amount contains a proportion for Export delivered by cart.

OFFICIAL STATISTICS OF THE COFFEE TRADE OF THE UNITED KINGDOM.

		1 Month ended Jan. 31		
		1913.	1914.	1915.
Imports	... cwts.	75,256	79,835	120,257
Home consumption	... cwts.	23,214	24,067	24,471
Exports	... cwts.	33,206	27,465	53,763
Total Deliveries	... cwts.	56,420	51,532	78,234
Stock on Jan. 31	... cwts.	177,000	276,000	376,000

WORLD'S VISIBLE SUPPLY OF COFFEE, FEBRUARY 1, 1915.

	Stock. 1915. Bags.	1914. Bags.
Europe—		
Copenhagen	66,000	72,000
Bremen	*46,000	138,000
Hamburg	*420,000	2,016,000
Holland	386,000	706,000
England	257,000	245,000
Antwerp	*978,000	1,047,000
Havre	2,014,000	2,886,000
Bordeaux	39,000	45,000
Marseilles	98,000	144,000
Trieste	*12,000	394,000
	4,316,000	7,693,000
Afloat to Europe ...	1,157,000	863,000

Visible supply, Europe ...	5,473,000	8,556,000
The United States ...	1,486,000	1,576,000
Afloat to U. S. A. ...	717,000	630,000
Brazil	2,452,000	2,514,000
Total February 1, 1915 ...	10,128,000	13,276,000
„ January 1, 1915 ...	10,091,000	13,665,000

	1915.	1914.	1913.	1912.	1911.
Quotation for Superior Santos ...	45/6	53/6	68/3	69/3	62/—

*Estimate.

—*The Produce Markets' Review.*

EXPORTS.

Coffee.—Continued high prices in Omdurman and competition have driven up Goré and Sayo prices from 15*s.* 6*d.* per cwt. in 1910 to more than double in 1914. The sources of wild coffee open to the Galla collectors yield about 1,100 tons, but with a more convenient system of taking the Government royalty at the last customs export station this amount could be increased. As it is, the Gallas are compelled to pick the berries and are allowed to keep those fallen to the ground. The royalty taken varies from 10 to 75 per cent. and no coffee can be sold before it is paid. The result is sudden congestion of market and corruption in the payment of royalty, which is far too heavy to encourage the trade. The Government does not open new roads to tap new forests, *e. g.*, those of Salle and Alga, south and south-east of Bure. Till this is done, the wild crop will not increase. Gambela supplies 65 per cent. of the coffee consumed in the Sudan, but Santos is likely to compete more seriously and force down prices to 270 pias, per kantar, or £3 1*s.* per cwt. Sudan consumption in 1913 was 1,656 tons, but with the growth of prosperity this should soon rise to 2,000 tons. With the new plantation coffee ready Gambela is quite capable of satisfying this demand and of exporting any surplus in transit to Europe.

Beeswax.—High prices and a favourable season had their effect, and 210 tons were exported against 122 tons in 1912. It is fetching at Goré and Sayo a steady £4. 8*s.* per cwt., or 14 dol. a farasula of 17 kilos. The wax of Gedami and Anfillo is still limited though of a better quality than Goré. An increasing trade, however, is being done with native merchants of Nejo and Lekempti, who come to Sayo and exchange wax for cotton fabrics, though the road dues are an undoubted obstacle. As in the case of coffee, there are still large forests unexploited round Bure and Goré owing to the apathy of the local authorities and their inability to cut new roads.

Rubber.—The drop in prices led to a cessation of activity on the part of the rubber régie. A slight rise enabled them to export a few parcels in 1913—a welcome addition to the exports. The organisation, however, of this monopoly needs to be changed and a more generous range of prices offered to Gallas who collect, if the monopoly is to be worked on a large scale. The high prices of coffee and beeswax compete for the labour of the collectors. Modern methods have not been introduced, and the Gallas are not being trained to collect economically.—*Diplomatic and Consular Reports, Abyssinia, trade of Gambela.*

TEA.

Indian Tea.—The slight lull in the demand towards the end of last week had entirely disappeared when the public sales were resumed on Monday. Rates were firm to dearer at the auctions, and buying was very general for all description up to 10*d.* per lb. This was even more pronounced at Wednesday's sale and only a limited quantity was sold under 9¼*d.* per lb., while medium Pekoes and Pekoe Couchongs up to 10½*d.* were also fully ¼*d.* per lb. dearer. Dust and Fannings were also in strong request, but Broken Pekoes over 10½*d.* were somewhat irregular. According to information received from Calcutta the total exports to the United Kingdom for the season will be about 218,000,000 lbs., after deducting the losses sustained at the hands of the *Emden*. This is an excess of some 21¼ millions over last year. The total deliveries, including Southern Indian Teas, for the past eight months show an excess over those for the corresponding period last year of about 24½ million lbs. About 63,300 packages are advertised for next week's sale. The Calcutta auctions are now very small, and the season is practically closed.

Java Tea.—The sale on Thursday was a small one, and only about 1,800 packages were offered. The competition was keen and previous rates were realised.

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended Feb. 6 ...	5,891,871	5,690,831	813,711	1,354,899
For 6 weeks ended February 6 ...	34,921,652	34,117,540	5,884,366	8,515,685

OFFICIAL STATISTICS OF THE TEA TRADE OF THE UNITED KINGDOM.

	One month ended January 31.		
	1913	1914	1915.
	lbs.	lbs.	lbs.
Imports—			
India	16,671,303	15,870,358	32,178,315
Ceylon	8,338,977	8,210,097	11,176,874
China	704,625	1,320,269	3,682,289
Java and Netherlands...	3,331,119	3,402,376	1,730,509
Other Countries ...	38,794	283,734	335,513
Total imports ...	29,084,818	29,086,834	49,103,500
Home consumption ...	26,096,618	27,950,398	27,110,369
Exports	4,848,213	4,705,367	7,397,657
Total Deliveries ...	30,944,831	32,755,765	34,508,026
Stock on Jany. 31...	136,051,000	113,872,000	135,852,000

—*The Produce Markets' Review.*

RINDERPEST.

Other Drugs in the Treatment of Rinderpest.

Many drugs and antiseptics have from time to time been tested in the Laboratory for the treatment of Rinderpest. Some were found to alleviate the symptoms and to prolong life for a few days. Others, undoubtedly aided recovery in a few cases, but no method of treatment which can be regarded as of much practical value has as yet been discovered.

Weak acids such as Hydrochloric, Salicylic, somewhat prolong the incubative period when administered the day following inoculation and also when given during the attack slightly prolong life.

Alkalies have no effect. When given in large quantity they appear to weaken the resistence of the animal and accelerate death.

Stimulants and emulcents alleviate the symptoms and frequently prolong life for a few days and in a few instances aided recovery.

Astringents given at the stage of diarrhoea have a decidedly injurious effect. When diarrhoea was abruptly checked, the animal rapidly succumbed.

With the exception of Iodine and Carbolic acid none of the antiseptics tests proved of any value. This is not surprising. The internal administration of antiseptics in infective diseases has met with little success in the past. There is no drug yet discovered which can be said to have any direct antiseptic action on the infective agent in the blood or body tissue. Most of the known antiseptics are also tissue poisons and have no specially selective action on micro-organisms. Others are so altered after the introduction into the body that their antiseptic properties are lost. A few drugs possess a special affinity or action on certain infective organisms such as Quinine and Arsenic. The quest of an antiseptic which can act as such when introduced into the body tissue would appear in our present knowledge futile.

There are, however, some antiseptics which undoubtedly do, to some extent, alleviate symptoms and aid recovery from certain infective diseases. This result is attributable to some indirect action of the drug, which increases the defensive organisation of the body, rather than to any deterrent action on the infective organism against itself.

It is remarkable that with the exception of Iodine in Actinomycosis, the action of mostly all the known specific drugs is directed against the protozoal parasites. For example, Quinine in Malaria, Mercury and Salvarsan in Syphillis, and Ipecacuhana in Amoebic Dysentery.

It is equally surprising that while a prophylactic or curative serum has been prepared against most infective diseases due to organisms of purely vegetable type, all attempts to discover a serum against the protozoal diseases have failed.

In the following experiments the administration of Iodine and Carbolic acid modified the severity of the attack of Rinderpast and in some cases led to recovery.

The animals used were hill cattle among which the mortality in the Laboratory is over 90 per cent. Death generally occurs on the 8th or 9th day. Treatment was commenced on the 4th or 5th day when the temperature had risen and vesicles formed on the gum and tongue.—*Memoirs of the Department of Agriculture in India.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 15.] APRIL 10, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department publishes a valuable article on Soil and Fertiliser Analyses. We especially draw attention to the decision of the Executive Council to appoint a Native Assistant Chemist to work under Mr. Anstead's supervision, and to the smallness of the fees compared with those charged by outside analytical chemists. We hope that by supporting this new departure, success will attend it. The scale of charges should be attentively studied. The Planting Expert also writes on Black Rot of Coffee, and draws attention to the article on the same subject kindly furnished to us by Dr. Leslie Coleman, Director of Agriculture to the Mysore Government. The Planting Expert also calls attention to a caterpillar pest of Tea on the Nilgiris.

We publish the report of the Proceedings of a quarterly General Meeting of the North Mysore Planters' Association.

Also are printed the Proceedings of a Special General Meeting of the Shevaroy Planters' Association, which was attended by Mr. Aylmer Martin, Director, U. P. A. S. I. Labour Department and Mr. Day, Deputy Director.

Black Rot of Coffee is treated in an article by Dr. Leslie Coleman, who gives an interesting history of the disease, and will be read with great interest by those planters whose estates suffer from the pest. Though not able as yet to state definitely a certain cure for it, he recommends us an efficacious method, spraying with Bordeaux Mixture, and considers that 15 an acre would be the cost: and believes that "one spraying if done thoroughly will be found sufficient to ward off the disease throughout the monsoon." We hope that those whose estates suffer will experiment and publish their experiences in the *Chronicle*.

From *Simmons' Spice Mill* we extract two paras. on Coffee and the British War Tax on Tea as it affects the Canadian Grocer.

From the Diplomatic and Consular Reports we take an article on the import of fertilisers into Japan, which shows a record as regards quantity and value.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Soil and Fertiliser Analyses.

When the laboratory was established in 1910, it was agreed that it was to be looked on as a necessary aid to the Scientific Officer's work, and that analyses would not be undertaken for planters as a matter of right. The practice which has been adopted is to refuse to undertake the analyses of soils at all, but to analyse fertilisers as opportunity permitted. The amount of routine analytical work which can be undertaken is necessarily very small, as the Scientific Officer's time is mostly taken up with other matters, and what time can be spared for laboratory work is devoted to research.

This is undoubtedly a most unsatisfactory position, since one of the main duties of a Scientific Department should be to afford facilities for the performance of analyses of soils and fertilisers, and there has been a growing demand for this work among planters, and a consequent growing discontent with the existing arrangements.

The Executive Council of the U. P. A. S. I. have decided to make an attempt to remedy this defect by appointing a Native Assistant Chemist to work under Mr. Anstead's supervision in the laboratory at Bangalore, and in future the Scientific Department will undertake analyses of Soils, Fertilisers, &c., a fee being charged for each analysis.

This seems to be a fair way out of the difficulty and the fees have been arranged so that they may just pay for the expenditure on this new project. It will be noted that they are very small when compared with the fees charged by outside analytical chemists.

This new feature of the Scientific Department is only an experiment, and it is hoped that it will receive the support of planters generally, since on the amount of this support its success must depend. Up to a point, limited by the actual number of analyses a man can make, the more work sent in the more likely the scheme is to pay for itself. If use is not made of the facilities now offered it is obvious that it cannot pay and it will probably have to be discontinued.

The need for analyses has often been insisted upon in these pages. Soil analyses should certainly be the basis of all manurial systems. Fertilisers bought on guarantee might have the guarantees checked with advantage. Country poonacs, bones, cattle manures, &c., should be bought on analysis, or at least analysed in order to enable correct doses to be applied.

An example of the need for and the value of such analyses occurred in the case of three samples of Ground Nut Poonacs which I have recently had occasion to analyse. The analyses of these three samples were as follows:—

	I.	II.	III.
*Organic Matter	94·82	43·69	95·17
†Soluble Ash	3·43	54·55	3·43
Insoluble Matter	1·75	1·76	1·06
	100·00	100·00	100·00
*Containing Nitrogen	5·67	6·29	6·58
†Containing Phosphoric Acid.	0·92	0·34	1·46

With Nitrogen at 8 annas per lb. the difference in value between the best and worst of these is Rs.10-8-0 per ton, and this is the loss to be

avoided. Analyses of the three would cost on our scale of fees Rs.6 to save Rs.10-8-0 per ton.

It is undertood that all analyses made by the Scientific Department under this new scheme will reach the planter through the Planting Expert and he will, when desired to do so, supply valuations of fertilisers based on the analyses and in the case of soils advice as to their cultivation and manurial treatment. This will be done free of charge as part of the regular routine of the Department for members of District Planters' Associations only; the fee is charged for the analyses only. Equally, of course, it must be understood that in future no free analyses will be performed.

It is hoped to appoint a man at a very early date and to be ready to start work on 1st May, while fees will be charged from the date of issue of this article at the following rates :—

Scale of charges for analyses by the Scientific Department of the U.P.A.S.I.

Half these rates will be charged to Members of District Planters' Associations.

		Rs.	A.
A.—Soils.			
1.	Complete chemical analysis including available Phosphoric acid and Potash (Dyers' method)	40	0
2.	Mechanical analysis	10	0
3.	Calcium oxide and carbonate content (acidity)	10	0
B.—Fertilisers.			
1.	Potash in Potassic Fertilisers	8	0
2.	Phosphoric Acid, total and Citrate soluble in Phosphatic fertilisers	8	0
3.	Organic matter, Insoluble matter and Nitrogen in Poonacs, &c.	6	0
4.	Organic matter, Insoluble matter, Nitrogen, and Phosphoric Acid in Fish, Bones, etc.	8	0
5.	Complete analysis of mixed Fertilisers, Composts, Cattle manures, &c.	20	0
6.	Complete analysis of Lime, Limestones, &c.	10	0

Black Rot of Coffee.

Dr. Coleman has most kindly sent us an article on this well-known disease of Coffee which is published in this issue of the *Chronicle*. Dr. Coleman has been studying the disease during the past year and has cleared up some of the mysteries which have hitherto enshrouded it. He has

succeeded in growing it in pure culture in the laboratory and finding one kind of spores which it produces. This has never been done before. His tentative recommendations for control should receive close attention and a trial by all Coffee planters who are troubled by this pest which undoubtedly causes very heavy losses each year.

This disease does damage in Porto Rico also, and a Bulletin of the Porto Rico Agricultural Experiment Station has recently come to hand which contains an account of the disease.

It is reported as sometimes occurring on sour orange, *Luffa aegyptica* and *Cucumis anguria*, two wild vines, and also on Hibiscus and Crotons. I have seen it here on Crotons and Dahlias in gardens and on *Strobilanthes*.

No spores or reproductive bodies have been found in Porto Rico and the account adds little to our knowledge, but in conjunction with what Dr. Coleman has to say about it the following extract dealing with remedies experimented with and recommended is of interest.

"Various remedies have been tried. The gathering and burning of the diseased leaves sometimes recommended gave poor results. Enough of the fungus remains on the stems to serve to reinfect the plant so that it is soon as badly diseased as before. The lime-sulphur sprays, of which both the boiled and unboiled were used, were ineffective, as was also the sulphur alone applied as powder. Bordeaux mixture is really effective. The fungus cannot grow on a leaf covered with this spray, and it adheres better than the other fungicides, especially when made up with twice the usual amount of lime. Owing to the frequent and heavy rains of the wet season even this spray is washed off to some extent after a few days. In attempting to increase the adhesion various substances were added to the mixture, including borax, but the ordinary mixture with merely an extra amount of lime was found to be better than any of these. In the use of any spray material difficulties are met with, among which is that of training the peon to direct the spray so as to cover the lower sides of the leaves and to be thorough in the work, leaving no unsprayed, diseased leaves to serve as centres of infection. On many trees reinfection takes place from the pieces of fungus threads which the spray has missed, or which have been partly concealed under the bark, making necessary repeated sprayings if the trees are to be kept clean. It is possible to destroy the fungus entirely on some trees by one spraying and to prevent the infection of healthy trees to a large extent, but to exterminate the disease even with repeated spraying is difficult. The work of one year seemed to indicate that spraying furnished excellent means of checking the disease, but further work has shown it to be less satisfactory than it first appeared. To open up the trees to the wind and air by felling the shade could only have a bad effect on the coffee and is not to be recommended.

"As the nearest approach to a good way of controlling the disease Bordeaux mixture made up with 4 pounds of copper sulphate and 8 pounds of unslaked lime or 16 pounds of air-slaked lime to 50 gallons of water applied as spray to the underside of the leaves is recommended. In no event should a larger area be treated than can be conveniently looked over from time to time in order to note any reappearance of the disease and resprayed when found necessary. Picking the leaves before the spraying will probably be of some assistance if care is taken to remove as carefully as possible all the threads on the twigs, using for the purpose the cheaper labor sometimes available for picking the berries."

A Caterpillar Pest of Tea in the Nilgiris.

Last February some specimens of a caterpillar were sent to me from the Nilgiris with the report that they had attacked a small patch of about half a dozen Tea bushes and practically stripped them of their leaves. On the way down the caterpillars pupated, the cocoons being tough and closely woven and formed in the fold of a leaf. About the middle of last month two moths and four parasitic flies emerged from these cocoons, and they were sent to the Imperial Entomologist for identification. He reports the moths to be *Heterusia virescens* and the parasitic flies Tachnids probably *Exorista heterusia* which forms an effective check on the closely allied *Heterusia cingala*, a tea pest in Ceylon.

The Imperial Entomologist, Mr. Bainbrigge Fletcher, in his book "Some South Indian Insects" gives a plate and the following account of *H. virescens* :—

"Distribution.—Nilgiris, Wynaad."

"Life History.—Not known. Probably very similar to that of *H. cingala*."

"Food plants.—Tea."

"Status.—An occasional local pest of tea, the caterpillars sometimes stripping the bushes".

"Control.—Collection of the caterpillars by hand and of the moths by hand nets. The moths fly by day."

"Remarks.—Apparently only once reported as doing damage in South India. The outbreaks in the case of the allied *H. cingala* in Ceylon are usually sporadic and severe in circumscribed areas, but parasites soon increase in numbers and hold the moth in check."

Watt and Mann give the following remedies for the allied species *Heterusia cingala*, and these apply to *Heterusia virescens*.

"The caterpillars should be collected and destroyed whereever seen"
"together with cocoons and even more especially the moths which"
"are brilliant and easily seen. All dead leaves should be swept up"
"from below the bushes and burned. The caterpillars are fortuna-"
"tely subject to the attacks of a parasitic fly *Exorista heterusiae*."
"This fly fastens its eggs upon the back of the caterpillar, the young"
"maggots penetrate the body of the host and feed on its contents,"
"taking care not to touch any vital spot until they are ready to"
"undergo their own transformation. The diseased caterpillar has"
"usually sufficient strength to spin its cocoon, but collapses without"
"turning into a chrysalis. The sudden disappearence of this pest"
"after reaching its climax is usually due to the work of this useful"
"parasite, though sometimes a bacterial disease is still more effec-"
"tual in the work of extermination."

The moths are conspicuous objects with black-green fore-wings and white or yellow bands and spots.

Any one who is interested in these insects and who has access to the following publications will find therein descriptions and coloured plates of them :—

The Bombay Natural History Society's Journal, XVIII, p. 430.

Indian Museum Notes, IV, 5, p. 279 and V, 1, p. 16.

The Tropical Agriculturist, XLIII, 2, p. 128.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

North Mysore Planters' Association.

Proceedings of a Quarterly General Meeting held at Balehonnur on the 29th March, 1915.

PRESENT.—Messrs. C. Danvers (Chairman), C. H. Browne, H. G. Bonner, R. G. Foster, C. P. Reed, E. W. Fowke, W. H. Reed. F. W. Hight, C. C. Kent, (Honorary Secretary). *By Proxy.*—Messrs. A. Durham, and S. L. Mathias.

The Minutes of the previous meeting were read and confirmed.

U. P. A. S. I, Labour Department.—Proposed from the Chair, and seconded by Mr. E. W. Fowke: "That a Committee be appointed to draw up rules for the settlement of Labour disputes in the District: which shall then be circulated to all planters in the district, for their opinions and adherence, and eventually to the Labour Department for its guidance in the settlement of disputes referred to it." This resolution was passed unanimously.

Resolved that Messrs. C. H. Browne, C. P. Reed, and C. C. Kent be appointed to the Committee.

Advances to Writers and Maistries.—It was decided that it was too late in the year to take any steps under this heading, but it was resolved that in view of the increasing lateness of writers returning to the estates, members be recommended to limit their writer's leave on full pay to 2 months in the year.

Arrears of Subscriptions.—The Honorary Secretary reported that only two Estates were now in arrears with their subscriptions, and stated that the Manager, Mr. E. C. Kent, had promised to pay this on receipt of a further statement of the amount due, as long ago as November 1st, but that in spite of several subsequent applications, no reply had been received. It was resolved that the Honorary Secretary be instructed to write again applying for subscriptions due, and also to write to those members who have recently sent in their resignations from the Association, pointing out that they are at liberty to resign such membership at the end of the current year, *i.e.*, June 30th, 1915, but that they are not equally at liberty to resign their obligations to the Assistant Scientific Officer Fund, guaranteed by them coequally with all members of the Association, and which obligation began on July 1st, 1912, and ends on June 30th, 1917. That it should be emphatically pointed out to such members that they are bound in *honour* as well as by their acceptance of the resolution guaranteeing the necessary funds, to subscribe 6 as. per acre for the full period of 5 years, and that any defaulting as regards subscriptions will bear unfairly on those members who honourably go on fulfilling engagements entered into.

Commission and Feeding Charges on Government Cattle Pounds.—Read and recorded letter No, 2594 from the Deputy Commissioner, Kadur District.

Letters from the Planting Expert.—Read letters Nos. 123 and 147 which were discussed and approved.

Assistant Scientific Officer.—Read correspondence anent the Assistant Scientific Officer, (Mysore). It was considered that the Council of Mysore Planters' Associations had not been efficient in the control of this Officer's work. On two consecutive occasions no member from one of the Associations had attended Council meetings.—a difficulty is experienced in getting a proper executive, and this Association expresses the opinion that

it would be much better to put the Assistant Scientific Officer immediately under the control of the Planting Expert, who might be consulted as to tours, etc., by the various Associations in Mysore. The Honorary Secretary was instructed to send copies of this resolution to the other Associations in Mysore.

Notification of Government Holidays.—As members are continually put to inconvenience and unnecessary expense by sending to the Treasury for cash, and finding it closed, and as the order passed some years ago by the Deputy Commissioner, that planters should be notified when the Treasury will be closed, has fallen into disuse and disregard, the Honorary Secretary was instructed to ascertain and distribute to all members a list of Government Holidays, and other days when it will be useless to send for change.

Coffee Stealing Case.—Read letter from Mr. F. I. Morgan stating that in the case of three persons found guilty of stealing coffee from his estate, the sentence given was only one month, in spite of the fact that one of the accused is an old offender, and that it was his second conviction for the same offence. Also that notwithstanding numerous applications to the Amildar for copies of the judgment, he had up to the present been unable to obtain the same. Resolved that this Association is of opinion that on the facts represented, the punishment accorded to an old and well known offender seems totally inadequate, and the delay in getting a copy of the judgment of the usual discouraging nature, but as no such copy has yet been provided, the Honorary Secretary was instructed to urge Mr. Morgan to persevere in trying to procure the same.

Roads and Communications.—Resolved that this Association views with the gravest apprehension the serious progressive deterioration in the condition of the roads in this district. That sections of some roads have had no work at all done on them during the current year. That this Association requests Government to investigate the cause which has contributed to the present unfortunate conditions, and to take steps to remedy them.

Election of Office Bearers.—Mr. A. F. Evetts having gone to England, Mr. C. P. Reed was elected President of the Association, and Mr. C. H. Browne, Vice-President.

(Signed) C. C. KENT,
Honorary Secretary.

Shevaroy Planters' Association.

Proceedings of a Special General Meeting held at the Victoria Rooms, Yercaud, on 13th March, 1915.

PRESENT.—Miss Gompertz, Messrs. E. Dickins, H. Dickins, R. A. Gilby, S. M. Hight. W. J. Leckler, K. Leeming, E. Large, E. L. Payser. W. Rahm, C. Rahm, C. D. Ryle, E. W. Short, B. N. Short, L. E. T. Short, G. Turner, J. Pringle-Waldeck and C. Dickins, (Honorary Secretary). Mrs. Morris by her Proxy Mr. R. A. Gilby.

Visitors—Messrs. Aylmer Martin, Director, U. P. A. S. I. Labour Department, Day, Deputy Director; A. Gompertz; N. Hight; and L. Hight.

(1) *Notice calling the meeting.*—The Notice calling the Meeting was taken as read.

(2) *Proposed Draft Labour Rules.*—The Honorary Secretary, on opening the meeting, stated that, in accordance with a resolution passed at

a meeting held on 26th January, he had invited Mr. Martin to attend a meeting of the Association to enable members to discuss with him the proposed Draft Labour Rules. Mr. Martin had kindly consented to meet them to-day and he had great pleasure in introducing both Mr. Martin and Mr. Day to those present and hoped a satisfactory agreement regarding the rules would be arrived at.

After carefully considering each rule by itself, Mr. Martin entering into full details and answering the various questions put to him and on his assurance that should some of them, after trial, be found inapplicable to this District, new ones could be substituted, the sense of the meeting was taken with the following results :—

Rule No. 1.—Agreed to.

Rule No. 2.—Agreed to at meeting of 18th December, 1914.

Rule No. 3.—Agreed to.

Rule No. 4.—Agreed to with the following alteration in section (A). "Instead of 6 months read 8 months."

Rule No. 5.—Omitted altogether.

Rule No 6.—Agreed to with the following continuation at the end "on the Shevaroy Hills."

Rule No. 7.—Agreed to.

Rule No. 8.—Agreed to at meeting of 18th December, 1914.

Rule No, 9.— Do, do. do.

Rule No. 10.—Do. do. do.

Rule No. 11.—Do. do. do.

Rule No, 12.—Do. do. do.

A proposal by Mr. B. Short to the effect that advances to coolies and maistries on all Shevaroy Estates be made on a fixed date, instead of as at present, met with scant support as the closing of crop varies in the different localities.

Vote of thanks.—A hearty vote of thanks was passed to Messrs. Day and Martin for kindly attending the meeting, explaining the rules and answering the various questions put to them. Mr. Martin replied in a witty and humorous speech and congratulated the members on having come to an agreement.

The meeting then terminated.

(Signed) CHAS. DICKINS,
Hon. Secy., S. P. A.

Two compositions are recommended against house-flies:—(1 Five parts by weight of crushed pepper in pods, 5 parts of quassia powder, 10 parts of castor sugar, to which 10 parts of spirit is added; the whole is carefully ground in a mortar and, when filtered, put on plates as a bait; (2) two parts per weight of sweet rush-root (*Andropogon*, which yields oil of citronella), 15 parts of starch and 1 part of eucalyptol, all ground into a fine powder, and scattered over the spots frequented by flies. The smoke from dried water-melon leaves is also said to kill flies.—*The Review of Applied Entomology.*

COFFEE.

By

HENRY NORDLINGER & Co., New York,

(Written especially for *Simmons' Spice Mill.*)

New York, December 7th.—A material improvement in values took place during the past month, due to the continued liberal takings by neutral European countries, likewise to the removal of the former existing fear that the United States would be virtually the only country to which coffee could be shipped during the European conflict.

The statistical position of coffee is exceptionally sound; stocks being smaller everywhere than in many years past, and the world's visible supply on December 1st, being about three million bags less than on the same date a year ago, this being accounted for by the liberal withdrawals from port stocks in Europe and by the delay in marketing the Brazilian crops.

A further improvement of values will, in our opinion, cause receipts at Brazilian shipping ports to run on a proportionately larger scale at a time of the year when they usually are very small because, in accordance with our calculation, there are still about five and one-half million bags in the interior of Brazil, a larger quantity than is usually held there at this advanced period of the crop movement.—*Simmons' Spice Mill.*

The British War Tax on Tea.

(*Canadian Grocer.*)

The placing of a war tax on tea by the British Government has created a good deal of discussion among the trade. Referring to the probable results of this decision, a prominent tea man said:

The three-pence additional duty imposed on tea in England will commence to yield revenue to the Government at once, because England has not been so bare of teas for 40 years as she is just now. The auction sales held weekly, for many weeks past have only averaged about 8,000,000 pounds of Ceylon tea, whereas, in normal times they average not less than Rs. 35,000,000 pounds, due to ships being held up.

The raise in duty of 3d. per pound will make the tea duty now 8d., or 16c. per pound. It was as high as this before, that is during the South African War. Of course, the tea duty there is practically the only way they can tax the vast number of people who do not use tobacco, or liquor.

As to how it will affect the market here, we do not think it will have any effect, because past experience has taught us that heavy duties on tea in England do not, to any extent, restrict the consumption of that article. Teas are extraordinarily high now, and, in fact, were high before the commencement of the war. They have been constantly advancing during the past three years, but since the war broke out there has been another advance of three to four cents per pound in both Colombo, Calcutta and also in London.—*Simmons' Spice Mill.*

INSECT PESTS.

At a conservative estimate, the annual loss from insect pests in Canada is considerably over £20,000,000, a very great proportion of which could be prevented, even with our present limited knowledge of control methods. —*The Review of Applied Entomology.*

FERTILISERS.

The import of fertilisers into Japan again shows a record both as regards quantity and value, as will appear from the following table:—

Articles.	1912.		1913.	
	Tons.	£.	Tons.	£.
Nitrogenous fertilisers ...	715,422	4,336,822	997,188	6,001,213
Phosphates ...	321,247	968,583	370,808	1,160,017
Other manures ...	--	35,638	—	54,034
Total ...	—	5,341,043	—	7,215,264

They represent about 10 per cent, of the total imports. Of this total Yokohama imported over one-third, valued at £2,420,485.

The most important of these fertilisers is oil cake, which in quantity and value represents over a half of the total. The import into Yokohama alone shows an increase of over £400,000. This article comes almost entirely from Manchuria in the form of bean cake, but rape-seed cake from British India continues to advance owing to cheap freight rates.

Sulphate of Ammonia.—This import is almost entirely from the United Kingdom, and was the same both as regards quantity and value as in the previous year, but prices slumped during the year, and some of the heavy stocks had to be sold at a sacrifice to meet obligations.

Nitrate of Soda.—There was an increase in the import of nitrate of soda into Yokohama of over £37,000. Wholesale prices in Tokyo ruled high throughout the greater part of the year, leaving a good margin of profit, and small stocks remained at the end of the year.

Phosphates.—The import of phosphates, principally phosphate rock, also shows an increase, and bone dust from India shows a small advance.

Tea.—The export of tea from the port of Yokohama has fallen from £1,374,433 in 1912 to £232,689 in 1913, and the port may be said to have ceased to be a market for this export. The trade, however, remains in this Consular district, having been transferred principally to Shimidzu, the port for Shidzuoka. The total export for the year was about 34 029,733 lbs., valued at £1,018,553, against lbs. 39.851,400 valued at £1,374,475 in 1912, showing a further decline of £355,922.

The market opened in May with prices lower than in the previous year, but they hardened towards the end of the month for high grade teas, it being realised that such qualities would not be over supplied. In lower grade teas of the first crop good value was received, prices ruling now. Second crop teas were poor in crop value with high prices which, however, soon gave way, holders being anxious to reduce their stocks, except as regards basket-fired teas, which were short in supply. The third crop was disappointing owing, no doubt to insufficient rain.—*Diplomatic and Consular Reports—Japan.*

Large imports of fowls and rabbits into the United Kingdom were made from Belgium before the war. All this trade with Belgium is completely destroyed now. France also supplied eggs and fowls to the United Kingdom —and Italy, Egypt and the United States also. The supplies cut off are from Russia (which came through the Baltic Sea), Austria Hungary, Belgium and partly from France which needs her own productions now.—*The Journal of the Jamaica Agricultural Society.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 16.] APRIL 17, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED)

Notes and Comments.

At a meeting of the Committee of Agricultural Experiments in Ceylon held recently the question of the best way to handle Tea shade in the dry weather was discussed, and it was agreed that it was advisable to lop the shade trees at the end of the rains, or the beginning of the dry weather, with the twofold object of preserving all the moisture in the soil for the use of the crop, and of giving to the Tea plants a good mulch which serves the purpose of further conserving soil moisture.

The *Report on the Progress of Agriculture in India* for 1913-14, compiled by the Agricultural Adviser to the Government of India, says about tea. "The steady increase in the area, production, and export of tea is a clear indication of the progress made in this crop. In 1913 there was an increase in area as well as production of about 3% over the preceeding year, while the exports improved by 4%."

"The Scientific Department of the Indian Tea Association, towards the maintenance of which an annual subsidy of Rs.15,000 is made by the Government of India, continued researches on problems affecting the quantity and quality of tea, including the control of pests and diseases. A series of experiments was carried out at the Tocklai Experiment Station with the object of determining the influence of manures on the growth of tea seedlings and a chemical investigation was begun with a view to find out the factors which influence the quality of tea. The question of manuring is now receiving a good deal of attention on many tea estates in North India, but any extended use of artificial manures is limited by the availability of labour which is hardly sufficient even to maintain proper cultivation under ordinary circumstances. Green manuring, however, is expected to receive increased attention as it is cheaper than chemical manures and requires less labour for a given result. In an actual experiment on one of the estates in Darjeeling an increase of 70 lbs. of tea per acre was obtained by green manuring."

"In connection with Mosquito Blight it has been ascertained that in general a definite relationship exists between the ratio of available potash and phosphoric acid in tea soils and the prevalence or otherwise of mosquito blight, and research is being continued on these lines."

Tea prices still rule high. The sale in London on 12 March averaged 11·15*d.* and of the Nilgiri tea sold, Kodanad topped the list with 130 packages at an average price of 11·5*d.*; of Travancore tea sold Kanniamallay headed the list with 216 packages at an average price of 11·25*d.*: of Wynaad tea the Meppadi W. T. Co. and Tanga Mulla share the honours with an average price of 11*d.*

The following is Mess Peek Bros. and Winch Ltd., report for the month of February taken from the *Indian Planters' Gazette.*

"The upward movement in the Tea market developed rather rapidly during February even in face of the reassuring statistics published by the Board of Trade at the beginning of the month. The stock in the United Kingdom then in bond was quite sufficient to supply four months' consumption even calculated on the most liberal scale known in past times. Close observers are therefore in some doubt as to the underlying causes which have brought about such a sharp advance in value and so far it does not appear that the great body of provincial opinion has seriously admitted its propriety or necessity. Of course, owing to the high level on which prices had been ruling for the last two years, retailers generally have worked on the smallest possible stocks, so that their ordinary daily outgoings have of necessity brought them into the market very frequently. There has undoubtedly been some extra stocking now by large operators whose output in the coming months has to be provided against when arrivals will be smaller. At the same time it is difficult in view of similar conditions which have prevailed several times in past years to arrive at a settled opinion that the present rise has not some speculative element behind it. Sudden upward movements in the past have so often subsided after a short time through lack of continued support that cautious buyers hesitate to follow them. The outlook for the next three or four months is somewhat difficult to forecast, but unless the export demand should assume proportions very much beyond those of the corresponding period of 1914, there ought to be a sufficiency of Tea now in bond, and to arrive, to supply ordinary requirements. But the fact still remains that all the lower grades of every growth of Tea have advanced about 1d. per lb. on the month, and opinions in the market point strongly in the direction of higher prices still."

"*Indian.*—249,200 packages were offered in public sale during February against 186,300 in 1914. The quality has been fairly satisfactory, although there were a great many lots with an undue proportion of stalk, but still useful in the cup; and it is probable that this fact may have helped somewhat towards the advance in price. There were some very attractive parcels of Autumnal picked Teas from Assam and Dooars which commanded a large amount of attention and realised very full prices; but, of course, buyers are aware that now is the one opportunity in the year when these are to be had, and if missed it may be ten or twelve months before similar Teas will be on offer again. Prices have gone steadily up during the month and in all the lower grades are 1*d.* to 1½*d.* per lb. dearer, but such is the competition for these descriptions that the medium to good Teas selling from 11*d.* to 1s. 1*d.* per lb. are unaffected and show excellent value by comparison. Shipments from Calcutta to the United Kingdom from 1st April, 1914 to 27th February, 1915, were 223½ million lbs., of which 7 millions were sunk at sea, against 195½ million lbs. in the previous year. The annual statement of the Indian Tea Association gives the total shipments from both North and South India for the year 1914 at 294½ million lbs. against 293½ million lbs. in 1913."—

The Produce Markets' Review gives the following statistics to the end of February:—

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended March 6 ...	5,188,958	9,424,720	919,884	1,182,512
For 10 weeks ended March 6 ...	56,843,297	65,467,153	9,838,990	13,031,263

OFFICIAL STATISTICS OF THE TEA TRADE OF THE UNITED KINGDOM.

	One month ended February 28.		
	1913.	1914.	1915.
	lbs.	lbs.	lbs.
Imports—			
India	9,624,848	11,467,914	16,738,432
Ceylon	7,187,119	7,624,733	8,746,428
China	359,306	807,895	1,569,373
Java and Netherlands ...	3,647,848	3,505,399	1,775,373
Other Countries ...	104,263	335,276	351,157
Total imports ...	20,923,384	23,741,217	29,180,763
Home consumption ...	22,933,171	24,801,709	30,213,625
Exports	4,151,575	4,049,420	4,556,759
Total Deliveries ...	27,084,746	28,851,120	34,770,384
Stock on February 28...	19,395,000	127,768,000	127,164,000

	Two months ended February 28.		
	1913.	1914.	1915.
	lbs.	lbs.	lbs.
Imports—			
India	26,296,151	27,338,272	48,916,747
Ceylon	15,526,096	15,834,830	19,923,302
China	1,063,931	2,128,164	5,251,662
Java and Netherlands ...	6,978,967	6,907,775	3,505,662
Other Countries ...	143,057	619,010	686,070
Total imports ...	50,008,202	52,828,051	78,284,263
Home consumption ...	49,029,789	52,752,098	57,323,094
Exports	8,999,788	8,801,787	11,954,416
Total Deliveries ...	58,029,577	61,556,885	69,278,410

The stock of Coffee in the middle of March was the smallest for the last five years, but prices did not rule as high as might have been expected in consequence. At the London sales on 12th March, however, Shevaroy and Coorg Coffee sold at satisfactory prices.

The following returns are given by the *Produce Markets' Review*.

LONDON COFFEE RETURNS.

	Home Consumption.		Export.		Stock.	
	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.
For week ended March 6 ...	475	292	404	603	15,251	16,025
For 9 weeks ended March 6 ...	3,758	2,617	4,394	3,492	—	—

OFFICIAL STATISTICS OF THE COFFEE TRADE OF THE UNITED KINGDOM.

		1 month ended Feb. 28.			2 months ended Feb 28.		
		1913.	1914.	1915.	1913.	1914.	1915.
Imports	... cwts.	104,560	150,343	142,566	179,816	230,178	262,823
Home consumption	... ,,	18,562	18,691	25,421	41,776	42,758	49,892
Exports	... ,,	22,541	42,545	54,594	55,747	70,010	108,357
Total Deliveries...	,,	41,103	61,236	80,015	97,523	112,768	158,249
Stock on Feb. 28..	,,	239,000	364,000	438,000	—	—	—

The India Rubber World says it was a more or less false alarm that broke the prices during the week ending 11th March. Licenses to ship rubber to New York had been issued very freely by the Rubber Exports Committee and plenty of business was the result. Suddenly it was reported that the Exports Committee meant to cease, as they were alarmed at the very large total tonnage of their licenses. Upon re-consideration of the matter it was found that a much smaller quantity was actually shipped and that holders of licenses had not been able to avail themselves of their chance. Moreover, it was found that American imports were below the usual average. These facts altered the attitude of the Committee and this becoming known on the market prices steadied up, and even advanced, but did not recover all the lost ground.

A prominent feature of the market in London is the inability of the daily offerings to more than supply the daily requirements; everything coming up at once finds a buyer. From 5th to 11th March Plantation crepe varied from 2/4 $\frac{3}{8}$ to 2/4 buyers, and smoked sheet from 2/5$\frac{1}{4}$ to 2/5, while fine hard Para varied from 2/5$\frac{3}{4}$ to 2/5.

Mr. F. Kaye, a well known rubber chemist, has published a large number of rubber analyses to prove that their phosphorus content is constant. He believes that this element materially influences the behaviour of the latex during coagulation and the quality of the rubber produced.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Samples of Soil for Analysis.

Now that the Scientific Department are going to take up analytical work, it will perhaps be well to explain exactly how samples sent for analysis should be taken, since it is obvious that this matter of taking samples is important. The following account applies to the taking of *soil samples* and it should be adhered to as closely as possible in the case of samples sent to this Department for analysis.

In the first place the types of soil to be sampled must be carefully noted and kept separate. When it has been decided upon, the area from which the sample is to be drawn should be gone over and at least three typical places chosen from which a sample is to be taken. These places should be chosen in such a way that they will yield an average sample of the soil; for instance a sample should not be taken near a big rock, or big tree, when the rest of the area has neither rocks nor trees.

At the places chosen for the taking of samples the surface is lightly scraped with a sharp tool to remove any surface vegetation which has not as yet become part of the soil. A vertical hole is then dug in the ground 10 to 18 inches square and 3 feet deep. The hole is dug out like a post hole, the sides trimmed with a spade, and the hole cleaned out. A note should be made of the appearance of the freshly cut soil, and the depth of the top soil to the sub-soil which is usually easily distinguishable. If the top soil changes gradually into the sub-soil with no marked line of division, which is the case sometimes, the samples of the top soil should be taken to a uniform depth of 12 inches. Now, a slice of soil 3 to 4 inches thick down to the beginning of the sub-soil, or to a depth of 12 inches when the sub-soil is deeper than this, is cut out with a spade from one of the sides of the hole and placed on a clean bag. From this sample stones bigger than a walnut may be picked out, but fine roots must not be removed.

A similar sample is taken in exactly the same way from each of the three or four places in the field decided upon. These samples are thoroughly mixed and large clods are broken up. Finally about 10 pounds of the mixed sample of soil taken in this way is placed in a clean bag, tied up, and carefully labelled.

It is advisable to place a label inside the bag before tying it up as outside labels sometimes get torn off in transport. Each soil sample should be taken in this way and the bags containing them put in a clean box and sent down to this office. It is important that bags and boxes used for sending samples should be clean and not have been previously used for fertilisers, and the samples should not be allowed to stand in the store before despatch near fertilisers of any kind.

I would here call attention to the fact that a sufficient quantity of soil should be sent; about 10 lbs. is the amount we like to have. Also as much information about the soil should be sent as possible. It is not much use sending a cigarette tin full of soil with no information and a request that it may be analysed and advice as to manurial treatment given. Exaggerated as this may seem it has actually been done.

Usually advice is required based on the analysis as to manurial treatment and when this is the case information as full as possible should be sent on the following points, and a good plan is to send a sketch plan of the field showing where the samples were taken, and the position of roads, streams, gullies, &c. Elevation and average monthly rainfall should be given. In the case of cultivated land it should be stated how long the land

has been under cultivation, what crops have been grown on it, what manures have been applied, and what yields have been obtained at any rate during recent years. In the case of virgin soil it should be stated whether the land is heavily covered with timber, or not, and what sort of timber. A description of the neighbouring land should be given and of outcropping rocks, &c. It should also be stated whether the land is steep or level, naturally or artificially drained, and whether there are hills, roads, gullies, ridges, &c., on it. Above all it should be stated what particular crop it is proposed to grow, or is growing, on it, a point very often omitted. The more local information that can be given the more useful is the analysis likely to be and the more likely is the Planting Expert to be able to give advice as to manurial treatment and cultivation that will be of value.

The benefits to be derived from a soil analysis are thus summed up by A. D. Hall. The mechanical analysis enables us to classify a soil and assign an unknown example to its type, while from the type, combined with a knowledge of the situation and climate, we may predict its suitability, or otherwise, for a particular crop. Chemical analysis tells us whether a soil is getting acid, or needs liming, to make it work properly and utilise the manure applied to it. From the chemical analysis we can settle what class of manures ought to be used; whether sulphate of ammonia or nitrate of soda; superphosphate or basic slag. Finally chemical analysis will often reveal particular deficiencies and the specific need for phosphates or potash.

A soil analysis is thus a great help in deciding upon a manurial system, but the final test must always be that in the field, and soil analyses should be backed up by field experiments on the soil.

The purpose of a soil analysis is not to learn the ultimate composition of the soil, but to ascertain what proportion of the elements of plant food in it may become available to plants within reasonable time limits. A "complete analysis" shows the proportions of Organic matter, Oxides of iron and aluminium, and calcium, and the amount of nitrogen, potash, phosphoric acid and of the two latter plant foods also the amount citrate soluble, that is immediately available to plants. All these items are important. The calcium oxide content shows whether the soil needs liming and whether basic fertilisers should be used in preference to others. The amount of organic matter shows whether organic fertilisers are needed and so on.

It will be seen therefore that though a chemical analysis of the soil alone cannot tell us exactly what system of manuring to adopt it is of great help, as a guide to such a system, which must, however, be finally tested and adjusted to the needs of the crop and special local conditions by actual trial in the field.

Cockchafers and Coffee.

In the Coffee districts of Mysore and Coorg a great deal of harm is sometimes done, especially to young plants, by the larvae of a cockchafer which feed on the roots. A reference was made to this pest in the *Chronicle* Vol. VI. p. 754,

The Imperial Entomologist, Mr. T. Bainbrigge Fletcher, now writes to tell me that he has recently received the identification of this beetle, specimens of which I sent him from North Coorg, and it proves to be *Holotrichia conferta*. Mr. Fletcher in his book, "Some South Indian Insects," figures this beetle on p. 150 and when speaking of this class of pest says. "Cockchafers of various kinds are common in all districts, usually appearing at definite times of the year, often in enormous numbers, and flying in to light at night, though rarely seen in the daytime. They are heavily built beetles-

with short legs and stout, rounded bodies usually coloured in a uniform shade of brown or grey, with short antennae terminated by an expansile fan of elongate-oval flattened plates. The beetles themselves fly by night and may do considerable damage by feeding on leaves of plants, especially of ornamental plants in gardens such as roses. It is not, however, only the beetles that are destructive, for the larvae live in the soil and do considerable damage by feeding on the roots of plants. They are white, fleshy grubs with three pairs of thoracic legs, and with the tip of the curved body usually swollen into a bluntly round extremity. These grubs usually live just at the roots of grass, coming closer to the surface in wet weather and retreating further down during dry spells."

The grubs and beetles themselves can be found in the soil round the roots of Coffee trees at all times of the year and they undoubtedly do a lot of damage and are often responsible for the death of young plants which have their roots eaten and then die off in the dry weather. In the dry weather the grubs get down deep in the soil and I have taken them out as deep as 2 and 3 feet.

Apterite appears to be the best remedy for this pest, and a great deal of success has been obtained with this soil disinfectant in North Coorg where it has given almost complete immunity from the attacks of the cockchafer larvæ.

It can be obtained from Cooper Nephews, Manufacturing Chemists, Birkamsted, England, and in old Coffee should be broadcasted at the rate of 1—2 cwt. per acre and worked in to the top soil. It is, however, particularly useful for protecting young plants and supplies from the attacks of the cockchafer larvae and in this case more care must be taken since it must not be allowed to come in contact with the roots of the young plant. Either the soil in the pits must be mixed with Apterite and left for some weeks and until there has been rain on them before planting, or if the plant is already in the ground, a narrow trench about two inches deep should be made round the plant just outside the root area and the Apterite placed at the bottom of this and covered over with Soil.

Spot Disease of Coffee Berries.

In this issue of the *Chronicle* will be found an account of a spot disease of coffee very similar to that which causes damage in some South Indian districts. This is said to be due to a fungus named *Cereospora coffeicola*. A note on this disease appeared in *Planters' Chronicle* Vol. IX, p. 659 where the cause of our disease was supposed to be the fungus. *Colleotrichum coffeanum*. It is possible that when our hoped for Mycologist arrives and gets to work he may find a relation between these two fungi which would appear to produce such similar results.

Minor Products of Estates.

The list of minor products available for sale on different estates which I proposed to have made for publication does not seem to have met with popular support, the only two responses I have had to date being the following:—

1. *Crotalaria striata*.—Seed. Rs.6 per bushel.
   Available from Mr. R. G. Foster, Sallebile P. O. Mysore State.
2. Dadap (*Erythrina lithosperma*).
   Fresh seed. 8 As. per lb. free packing and delivery on rail.
   Available from Mr. T. H. Pascoe, Kullakamby P. O., Nilgiris.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Bababudin Planters' Association.

Proceedings of a Quarterly General Meeting held at the Kadur Club, Chickmaglur, on the 4th April, 1915.

PRESENT.—Messrs. A. P. Boyd (President), F. Hugonin, N. G. B. Kirwan, R. D. Lovett, H. Watson, and S. H. Dennis (Honorary Secretary). Honorary Member: Mr. K. Krishna Iyer, Deputy Commissioner.

The Minutes of the last meeting were taken as read and confirmed.

Scientific Department.—Read letter with reference to the postponement of the taking over of the Scientific Department by the Government of Madras, due to the financial stringency caused by the War, and the difficulty of recruiting a Mycologist at present.

Read letter from the Planting Expert, dated February 13th, 1915, *re* Bees and Coffee Pollination, also a letter dated February 19th, 1915, with reference to the Imperial Institute Technical Information Bureau. A letter from the Chairman, Council of Mysore Planters' Associations was also read to the meeting and referred to the "Council."

Bababudin Hill Road.—Read letter dated 9th March, 1915, from the Officiating Secretary to the Government of Mysore, General and Revenue Departments, informing the Association of their decision in the matter.

Santaveri Dispensary.—Read letter from the Superintendent, Agriculture, Education, and Industries, Kadur District, together with copy of the resolution passed by the Mulnaad Improvement Committee. The following resolution was proposed and carried by the meeting:—"That Government be asked to expedite matters as the Dispensary is urgently required."

Labour.—Messrs. Peirce, Leslie & Co., Ltd's. letter dated November 13th, 1914, was read and recorded.

Gift of Coffee for troops at Front.—A vote of thanks was proposed and carried to Mr. K. Krishna Iyer, Deputy Commissioner of Kadur District, for arranging to collect and despatch the Coffee to Bombay.

The Meeting closed with a vote of thanks to the Chairman for presiding.

(Signed) A. B. BOYD,
Chairman.
(„) S. H. DENNIS,
Honorary Secretary.

COFFEE CHICKORY.

One of the many unexpected effects of the War, says the *Gardeners Chronicle*, is that on the price of chickory which has risen enormously owing to its scarcity. The cultivation of chickory is carried on in the invaded reglons, Departments du Nord, and Pas de Calais and Belgium as well as in Holland and German.

The growing of Chickory has progressed extraordinarily of recent years in France, particularly in the neighbourhood of Lille and Dunkirk, where it often replaces that of the sugar beet. The present yield is 220,000 quintals more than four times that of twenty years ago. Even so production has failed to keep pace with consumption.

COFFEE.

Spot Disease of Coffee.

This spot of the berry is troublesome since it causes the fleshy part of the fruit to adhere to the parchment, thus making the process of preparation more difficult. It is also the cause, at least indirectly, of part of the injury to the grain which results in its being classed as of lower grade.

The fungus causing this spot, *Cercospora coffeicola*, has been reported from Central and South America. Doubtless it occurs throughout the American coffee-growing regions. In Porto Rico it is present to some extent in every plantation. Both leaves and berries are affected by the disease. On the leaves it causes round spots, varying from 6 to 10 millimeters in diameter, of a brownish colour somewhat lighter toward the centre than at the edge. There are rarely many on any one leaf, and so little harm is done by the fungus as a leaf parasite as to be negligible. On the leaves, however, they produce spores which serve to spread the disease and to carry the fungus over from one crop to another. On the berries the largest almost always are found on the upper side. Any part of the fruit may be attacked, the spots appearing at first as small brown discolorations. They are especially common on the nearly ripe berries. At the time of picking, the larger spots cover about half of the fruit and are velvety with the spore-bearing outgrowths of the fungus.

The occurrence of the largest and worst spots on the upper or sun-exposed side of the berries is to be explained by the fact that the spots develop more rapidly in the somewhat riper tissue of that side, such uneven ripening of the berry being caused by the direct exposure each day to the sun rays. After the berries have become infected this one-sided ripening takes place more rapidly, the berries being black above with the *Cercospora* spot and still green on the underside. Whether picked at once or left until thoroughly ripe the berry is difficult of preparation and yields a somewhat inferior product. That the riper tissue furnishes more favourable conditions for the fungus is indicated by the more rapid development of the spots produced by inoculation into ripe berries, and the greater number of spots developing on the nearly ripe tissue.

The uniformity with which the upper side of the berries is the part most injured may account for the idea that such berries are injured by hail. As a matter of fact hail is almost unknown at the elevations where the worst affected plantations are situated. Another and better explanation quite commonly given is that the berries are burned by sun either directly or intensified by the lens-like action of drops of water, the disease itself being for this reason sometimes referred to as the "sancocho" of the berries. The presence of an organism, of proved parasitism, even in the earliest stages of the diseased spots, makes these theories untenable. Sunlight is a factor of importance, but only as it influences the development of the spots that happen to occur on the upper side of the berries. These become conspicuous and are thought to be the only ones, the other remaining unnoticed.

Since the existence of a close relationship between the distribution of the disease and conditions as to shade would make possible a practical means of control, it was thought worth while to secure data with regard to this. Accordingly samples were taken from each of the gatherings made in two fields, one with fairly heavy shade, the other exposed to the full sunlight. The quantity of berries examined from each field

varied from 132 to 199 litres per season, amounting to from 15 to 20 per cent. of the entire yield. The condition as to soil and slope were fairly uniform in each, so that the samples may be taken as representing the quality of output fairly well. For two years determinations were made of the proportion of *Cercospora*-spotted berries, including spots of 1 millimeter in length or more. It was found to vary according to the degree of maturity of the samples examined, but reached for the last year 73 per cent. for the shaded and 70 per cent. of such berries for the sun exposed. It was concluded that, so far as the actual distribution of the disease goes, it is not influenced largely by differences with regard to light. The relative occurrence of the more troublesome or "sancocho" form of the spots was quite different as, in the determinations made the following year, when there were taken only berries in which the spots were sufficiently developed to be blackened and dried to the cascara, it was found to be 16 per cent. in the shaded and 27 in the unshaded coffee.

It is well known that there is considerable variation in the quality of coffee, one of the characters of an inferior grade being the larger proportion of blackened and shrivelled grains. As it was thought the *Cercospora* spot of the berry might be the cause of such grains, at least indirectly, the spotted berries, used in the work already mentioned, were subjected to the usual process of preparing the grain. In the case of those used in the earlier work, where even slightly spotted berries were included, only those of which the parchment was found, in the course of preparation, to be injured or seriously discoloured were selected for the final preparation, such parchment being taken as corresponding to the larger, deeper *Cercospora* spots. Those with sound parchment were not considered farther except to be measured, as it was thought that sound berries or those slightly spotted would give only good grains. Later it was found that some of the injury to the parchment on the berries selected for final preparation was due to merely mechanical injury of the pulping machine. Moreover, it was found that a certain proportion of the sound berries contained bad grains. The results are for this reason not given in full, although they give as uniform and pronounced differences in favour of the product of the shaded trees as the later, more accurate work. Of the grains with any sort of injury the percentage was 33 for the unshaded trees and 19 for the shaded the first year, and the following year 29 and 20 per cent., respectively.

During the last season in which this work was carried on only the more severely attacked berries or those in which some effect on the grain seemed possible were used, the slightly affected ones being classed with the sound berries. The proportion of imperfect grains of all sorts was determined, and of these the blackened ones were separated and also determined. The results given in percentages are as follows:—

THE EFFECT OF SHADE ON THE QUALITY OF THE GRAIN.

	Shaded. Per cent.	Unshaded. Per cent.
All injured grains in good berries ...	4·5	19·0
Blackened grains in good berries ...	2·0	11·0
All injured grain in badly spotted berries ...	27·0	45·0
Blackened grains in badly spotted berries ...	9·0	36·0

It is evident that the berries more severely spotted by *Cercospora* contain a greater proportion of bad grains than the unspotted, indicating that the fungus does influence the quality of the grain unfavourably. That the sound-appearing berries should give so much inferior grain or any at al

is surprising and not yet well understood. The larger proportion of bad grains in *Cercospora*-affected berries from the unshaded field is in accordance with the greater abundance of the more severely attacked berries generally apparent in such conditione. The results show in every instance, whether from spotted or sound berries, a smaller proportion of bad grains to be produced from the shaded field.

It is clear that *Cercospora* has nothing to do with a considerable proportion of the inferior grains, since they occur in sound berries. It has never been found among the organisms isolated from the grains of these berries nor from those of the spotted berries. Such injurious effect as it may have on the grain must be due to the shrinkage resulting from increased loss of water from the spotted fruits, as well as the admittance through the weakened tissue, at the point attacked, of other organisms which attack the grain directly. Of these several have so far been found, the most common being a *Fusarium*. The injury resulting from the spot seems to depend on the age of the fruit attacked. When the infection takes place on undeveloped fruits the resulting injury is greater, but if the grain has begun to harden before the spot develops fully it may escape injury.

Another source of the inferior quality of coffee from sun-exposed fields is to be found in the "granos vanos," berries that seem to be well filled out and good, but which are easily recognised at the time of picking by their yielding readily to the pressure of the hand and also by the dried, blackened pedicels. The name could be applied as well to the sound-appearing berries with bad grains mentioned above, but for convenience it is here used to indicate those the injury to which is due to the supply of food material having been cut off, as shown by the dead pedicels. Not insolated berries alone, but often all on one branch or the entire tree are affected in this way. The shrivelled grain contained in these berries remains free from fungi or bacteria for a long time, the injury being clearly not due to these organisms. The blackened tissue of the branch at the base of the pedicels always contains a *Gloesporium*, and occasionally a *Fusarium*. But neither of these fungi was found to be able to attack the tissue of healthy green branches when tried out by inoculations with pure cultures. It would seem that they are only able to attack weakened trees exposed to full sunlight and subject to the unfavourable soil conditions accompanying such exposure. Not all the trees in unfavourable conditions produced berries of this sort. What the proportion may be was not determined, but it is only large in the first picking. This was omitted in the earlier work, and in that of the last year the "granos vanos" were separated out, so that the result can not be affected to any extent by their presence in the samples. The hormiguilla (*Myrmelachista* sp.) is to some extent the cause of these "empty berries." as it often injures the base of the fruit-bearing branches and sometimes the pedicels, thus cutting off their supply of food.

It is known that the soil in well-shaded places is more uniformly moist than in more exposed situations, and no doubt the benefit of shade in coffee is in part due to better soil conditions, especially with regard to moisture. The soil in unshaded places becomes very dry in the season of little rains and also very hard where of the clay type. The unfavourable condition as to moisture is made worse by the presence of grasses which always come in where shade is lacking. The trees in these places are slender, with few branches and but little foliage. The leaves of the branches on which berries set fall when these are half grown and the branches begin to die back at the tips. Where the blackening extends rapidly killing the bark and pedicels, the "granos vanos" result. The trees, which are dependent

on new branches for leaves and berries, are able to form but few of these. A product of inferior quality results, owing to the action of certain diseases of the fruits and grain, thus increasing the loss caused by lessened yield.

Studies of the Spot Fungus.

In attempting to determine definitely the nature of the organism producing the spots, the earliest stages of the spots were studied. The berries with such spots were first sterilised and then introduced into the medium, or the spot itself was cut out and introduced into the medium, using the usual precautions. When the sterilization had consisted in washing the berries for three minutes in 90 per cent. alcohol, then placing them in 4 per cent. formalin for three minutes, and finally washing in sterilised water, the spotted berries usually gave, in addition to a sterile gray fungus, a *Gloeosporium*, while the check unspotted berries similarly sterlised often gave a *Gloeosporium*. With less severe sterilisation a *Fusarium* was often obtained in addition to the above. Later work, with more thorough sterilization, gave only the sterile fungus from the spots. Both the *Fusarium* and the *Gloeosporium* were tested in inoculations, but without positive results. The sterile fungus was used in inoculations, with the results that typical spots were produced on which *Cercospora* spores later developed. In the checks small pieces of sterile absorbent cotton of about the same size as the pieces of mycelium were introduced into small wounds, the purpose being roughly accomplished in the case of those checks, although the chances of such infection from natural sources existed. No attempt to sterilise the berries on the trees before this inoculation was made, and the results showed it to be unnecessary. From the spots resulting from the inoculation the usual gray sterile fungus was reisolated.

No spores of *Cercospora* were borne on the mycelium in artificial culture. However, on some of the mycelium placed on the berries but slightly introduced into the wound, abundant spores of *Cercospora* were in one instance produced. The material used in the inoculations of the following season was obtained from spores developing on typical spots of the berries. The spores, because of their comparatively large size, are easily isolated from drop cultures. The germinating spores, were transferred directly from the agar of these cultures to the usual media. In every case the typical gray sterile mycelium, similar in every way to that used in the inoculations of the preceding year, resulted. This when inoculated into the berries produced the usual spots from which it was reisolated, and there can thus be no doubt as to the identity of the organism producing this spot. An attempt was made to show that the spot on the berry could be produced by spores from the leaf spots. When transferred directly from the leaves to the berries no infection resulted. Later pure cultures from the spores of the *Cercospora* of the leaf were obtained, as in the case of that of the berry. The resulting growth, which was similar in every way to that in cultures of the berry fungus, when inoculated into the berries, gave positive results, typical *Cercospora* spores later deleloping.

In conclusion it may be said that the spot of the berries produced by *Cercospora coffeicola*, which besides interfering with the preparation by causing the flesh to dry and adhere to the berry also injures the grain to some extent, may be largely prevented by the use of sufficient shade, as, for example, that of sufficient density to prevent the growth of grasses other than palmilla. Such shade is distinctly favourable to the production of coffee free from inferior shrunken grains.—*Porto Rico Agricultural Experiment Station. Bulletin No. 11. Fungus Diseases of Coffee in Porto Rico.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 17.] APRIL 24, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED)

Contents.

The Planting Expert in his Scientific Department Article gives advice on the best methods of selecting and sending samples of fertilisers for analysis. The last para. is of special interest, which if followed by those sending samples and carried out by them when doing so, will save endless time and correspondence. He also deals with the Markets for Rubber, Tea and Coffee.

We publish the proceedings of the South Mysore Planters' Association and the Shevaroy Planters' Association. The address of the Chairman of the former Association is interesting, and we regret to read that prospects for the coming crop are not very promising. We note that with due care and foresight, he does not apprehend much damage from Green Bug. We also note the change in the Honorary Secretary from Mr. Rutherford to Mr. A. Thomson.

We regret the loss sustained by the Shevaroy Planters' Association in the death of Mr. Robert Gompertz—an old and valued member of the Shevaroy Association and a one time Chairman of the United Planters' Association.

From the *India Rubber Journal* we extract an article on the "Rubber Industry in France." It will be noted that to a Frenchman the civilised world owes its earliest knowledge of India Rubber. The enormous progress made in this industry in France is shown by the fact that there are 110 companies large and small, engaged in the manufacture of rubber tires and hose.

We would draw very special attention to the advertisement published by the Scientific Department regarding the scale of fees for Analyses in the Bangalore Laboratory, and to the special rates to be charged to all members of the District Planters' Associations, and we trust that with the advent of an Assistant full advantage will be taken of this Laboratory by all Planters, for on their support must depend the success of this new departure.

The Chairman has suggested that the middle of August this year will be the most suitable time to hold the Annual Meeting of the U. P. A. and the Secretary will circularise District Associations, to that effect.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Sampling of Fertilisers for Analysis.

In the case of fertilisers it is most important, especially when it is desired to have seller's guarantee checked, to take a thoroughly representative sample, and everything should be done to attain this result.

In the case of artificial fertilisers which are contained in bags, or drums, a sample should be taken from every tenth bag, taking it from different places in the bag, for instance from the top of one, the middle of the next, the bottom of the third, etc. These samples are thoroughly mixed and a final sample of *not less than one pound* drawn and placed in a clean bag, or tin, and forwarded for analysis.

If the material it is desired to sample is in a heap, a number of samples should be taken from the mass, and not only from the surface of the heap, distributing the points from which the samples are taken as widely and evenly through the mass as possible. As before the partial samples are thoroughly mixed and the final sample for analysis drawn from the mixture.

In the case of Poonac which may be in lumps, or Cattle Manure, or Compost, all of which are difficult to sample, a larger number of partial samples should be taken and of larger quantity. These are mixed together, big lumps broken up, and in the case of Cattle Manures and Composts, *at least two pounds* sent for analysis.

With regard to the use of clean bags, boxes, or tins in which the samples are packed for transport, the need for careful labelling, both outside and inside the packages, and the forwarding of full information, all that was said on this subject last week when discussing the sampling of soils for analysis, applies equally to fertilisers.

The information required about fertilisers, especially if a report is required on their merits, should include the following details as fully as possible. The price of the fertiliser per ton, where it is obtained, and its guarantee if it is sold on a guarantee. The cost of transport to the estate. What crop it is proposed to use it for, and at what rate per acre it is to be applied, and at what time of year. In the case of manures bought locally, their price and cost of transport to the estate should be stated.

Markets, &c.

Rubber prices fell during the week ending 18th March owing to the wharves working better, says the *India Rubber Journal*, so that imports found large quantities coming up ready for sale, and also on account of a strike at the Surrey and Commercial Docks which delayed the outward shipment of a large cargo of rubber to New York. The range of prices during the week was as follows:—

Crepe ...	...	2/4 to	2/3¾
Smoked Sheet ...	...	2/5 to	2/4¾
Hard Fine Para ...	...	2/5¾ to	2/5

The following quantities of Tea in lbs. were shipped from the Madras Presidency during the month of March.

	Black.	Green.
To United Kingdom ...	1,838,951	—
To Ceylon	249,528	48,134
To Straits Settlements ...	60	—
To Atlantic Coast ...	620,492	—
To South Australia ...	220	—
To Victoria	5,004	—
To France	31	—
To Persia	58	—
Total...	2,714,324	48,134

During the week ending 19th March prices had a continued upward tendency and every grade up to about a shilling a pound had an advance, bringing the lowest quotations for all but dusts up to practically 10¾ per lb.

The following quantities of South Indian tea were sold according to the *Indian Planters' Gazette.*

	Quantity.	Average Price. Highest.	Lowest.
Nilgiris ...	1,649 packages.	11½*d.*	11 *d.*
Travancore ...	2,218 „	11½*d.*	10¾*d.*
Wynaad ...	362 „	11 *d.*	10¾*d.*

According to the *Produce Market Review* there were again heavy deliveries of Coffee both for home consumption and export during the week ending 19 March. Prices have steadily advanced, Costa Rica and other Central American kinds being a shilling dearer. Of the East Indian crop it is said that Mysore, despite the smallness of the bean owing to the drought, will be of fine quality. Some of the Coffee from other parts of India, however, is said to be poor, the berries being badly developed and showing lack of colour and lack of quality in the cup. The following are the London returns.

	Home Consumption.	Export.	Stock.
For week ended 13th March ...	497 tons	608 tons	15,443 tons
For 10 weeks ended 13th March ...	4,255 „	5,002 „	—

The following prices were quoted on 19th March.

Mysore.	good to medium ...	72*s.* to 85*s.* per cwt.
	fine to finest ...	88*s.* to 115*s.* „ „
	triage ...	66*s.* to 83*s.* „ „

The Board of Trade Journal quoting from the *Frankfurter Zeitung* says that owing to the war the German Potash Syndicate has practically lost its export trade, its principal source of profit. The business remaining comprises chiefly sales for domestic industries and above all for German agriculture. Sales for the latter promise to increase, because owing to considerable rises in the price of other fertilisers, such as phosphates, and nitrogenous substances, farmers are turning to Potash manures this Spring, so as to ensure the best possible harvest. This increased business may not, however, balance the enhanced cost of production in the works, which has been caused by lack of workmen, smaller production, and high prices of necessary raw materials. It is stated that efforts are being made to induce the Federal Council to allow a slight rise in the price fixed by the "Potash Law" for potash for use in domestic agriculture.

Last week we quoted Dr. Kaye as saying that analyses of plantation and fine hard Para rubber showed them to contain a constant phosphorus content. He now writes to the *India Rubber Journal* to point out that this is not correct, but that what he has discovered is that the phosphorus content of fine hard Para is approximately constant while that of plantation rubber is variable, and he suggests that this variability expresses or may be explains the technical variability of plantation rubber.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

South Mysore Planters' Association.

Minutes of 51st Annual General Meeting held at the Mudigere Travellers Bungalow, on 27th March, 1915.

PRESENT.—Messrs. J. G. H. Crawford (President), M. J. Woodbridge (Vice-President), F. M. Hamilton, C. Lake, C. J. Hayward, A. Thomson, and E. W. Rutherford (Honorary Secretary).

The President in the Chair. In opening the Meeting the President said:—

"Gentlemen,—This past year, the fifty first of the existence of our Association, will, I think, be looked upon as one of the most important in its annals, as during that period events of moment have occurred not only in our own little world but in the great outside one on whose welfare ours is dependent.

Season.—The season just ending has proved to many of us a poor one to be followed I fear by one equally so. The fine prospects of October and early November have been spoilt by a bad attack of leaf disease and untimely rains of December, January and February, so I much fear our community will have to face a most unusual event *viz.* two bad yields in succession. That it will be faced and surmounted successfully I have no doubt.

The Labour Department has been successfully inaugurated and promises well for the assuring of problems in connection with the working of Estates, advances to maistries, etc. The Manager of the undertaking having had previous experience of the working of a department of this nature is a factor that should materially tend to its success and that it may be successful and as useful to planters of S. India as a similar project has proved to our brother planters in Ceylon, is our sincere wish.

Roads, Railways, etc.—I am pleased to be able to say that the long talked of Railway from Mysore to Hassan and Arsikere is under construction and is I understand likely to be opened for traffic in a year's time. In regard to the roads our Assscіation has pointed out on several occasions the bad state of several of the main high-ways, an improvement has been promised and a special grant has I am informed been sanctioned for two that were in very bad order. That this will be the future policy in regard to all main roads is to be earnestly desired.

Postal.—For the past eight months constant complaints of the irregularity in delivery of the mails in Saklaspur, Mudigere and Hanbalu have been made. On many occasions the Mail Tonga arriving one and two hours late which causes a great deal of inconvenience, in that letters to those residing at any distance from the P.O. cannot be delivered the same day. The subject has been brought to the notice of the Postal Authorities but with no result, as during the present month, when bad weather and heavy roads cannot be pleaded in extenuation, the delivery was equally erratic. The matter is one of importance and the problem of bettering the delivery should in the interests of the Public have the earnest consideration of the Postmaster-General.

Government.—This year sees the retirement of Mr. P. R.W. Wetherall from the services of H. H. the Maharajah of Mysore, both he and Mrs. Wetherall will be much missed in Hassan where their bungalow has always been the scene of great hospitality. We wish them many a long and happy year in the Old Country and the enjoyment of a well earned rest. I grieve

to say that 1914 finds our Association poorer by the deaths of Mr. Graham Anderson, C. I. E., and Mr. Robert Elliot both of whom were original members and did much strenuous work in the early history of our community in Mysore, work that we are now benefiting by. The former gentleman in particular hardly missed a meeting in a long and active career. His cheery presence, sound advice and great experience are much missed. Both will be held in affectionate remembrance and their labours in the cause of the planters of Mysore appreciated so long as the industry is carried on in this State.

Pests.—In 1913, Green Bug made its unwelcome appearance in this district. I was at home at the time so cannot speak from experience as to its extent, etc., but can say that in spite of it record crops were harvested. In 1914, there was a recurrence on a small scale but prompt measures in the hot weather kept the pest in check. During the monsoon fungus attacked the bug so extensively that at the end of the first month of the rains it was impossible to find a single live insect. Some, however, were harboured by ants as on a few bushes (coffee) here and there specimens have lately been noticed but on a far smaller scale than 1914. Greatest care is taken in coping with the plague in its initial state. I am of opinion that aided by favourable monsoon and fungus our industry has little to apprehend from this visitation.

Before concluding there is one subject I would like to touch on *i.e.*, the meeting places for other than Annual General Meetings. By existing arrangements only one gathering of the S. M. P. A. can be held in Saklaspur in two years. This seems to me unfair as this centre is convenient for as many men as Arehalli, Chickenhullie or Hanbalu. I would suggest that in future meetings be called in rotation at Saklaspur, Chickenhullie and Mudigere. I must now thank our Honorary Secretary for the very able way in which he has carried on the business of the Association during the last year and thanking you, Gentlemen, for the honour you did in electing me your President, place my resignation in your hands."

(Signed) J. G. H. CRAWFORD,
President, S. M. P. A.

The Honorary Secretary then read his report as follows:—

"Mr. President and Gentlemen,—You have 31 members representing 6,902 acres and 2 members paying on the Rupees 10 basis. I am sorry to say one member representing 30[illegible] acres has sent in his resignation, but I hope he will reconsider the matter.

Finance.—The accounts are on the table. As decided at our last Annual Meeting, your Reserve was increased by Rs.200. It therefore stands at Rs.500 invested at fixed yearly deposit with the National Bank of India, Madras, at 4% falling due on 2nd April, 1915. Interest on last years' Reserve was drawn by me and placed to the credit of your General Account. Your General Account shows a balance of Rs.782-3-8 in hand besides which there is also Rs.701 still due by Members the majority of which I expect will be received soon. One member, however, owes 2 years in spite of having been reminded of the same. It is very advisable for members to pay up their subscriptions as regularly as convenient, as their Association benefits thereby, as ths bigger the amount standing at the Bank the more interest. I should think your Reserve might be increased greatly as you have a big surplus showing, after allowing for other items in the Budget. I make this surplus Rs.1,853-11-8. On account of the Planters' Benevolent Fund Rs.190

has passed through my hands, and been forwarded to the Honorary Secretary of the Fund. This account is not properly an Association one, and a certain amount of expense that has to be at present incurred in remitting the money, receiving and forwarding receipts, might be saved, if members all sent their subscriptions to the Honorary Secretary of the Fund direct, besides it would save your Honorary Secretary a good deal of work.

Executive.—This as now formed *viz.*, Vice-President in place of a Committee has been found to work well and save your Honorary Secretary a lot of correspondence.

Roads.—A lot of correspondence has taken place on the subject and papers relating to same are on the table.

Scientific Department.—A copy of a letter of the Madras Government is on the table, and from it you will see the scheme for taking over this Department has, owing to the War, had to be kept in abeyance. In the meantime a small Committee has been appointed by the U. P. A. S. I. to prepare a definite programme to place before the Associations, and the Madras Government, when the matter is taken up again. I may add that the Chairman of the U. P. A. S. I. had arranged how funds could be found to meet the scheme, when War prevented matters going further.

Rules.—These badly need putting in order and reprinting. A Sub-Committee was appointed at the last meeting and will give your their report now, so as to enable you to put the same on a sound footing.

Title Deeds.—This subject is still awaiting the Government's reply, which they have promised to give.

Hassan District Board.—After being without a member for 2 years out of three years period one is elected to serve, you elected one, but I think you will soon have to send in a name again as the 3 years is nearly up.

Co-operative Purchase of Manure.—Your Sub-Committee had worked out a lot of information on this subject, when owing to the War, it was decided that nothing more could be done at present. A lot of thanks is due to them for their work and also for consenting to keep standing their final report till better times. I now place my resignation in your hands, and thank you all for the way you have put up with my shortcomings. To my President and Vice-President I tender special thanks, as never mind how much I called on them (and I was always at it) they were always ready to give me their opinion by return. This is the greatest help to an Honorary Secretary, as it enables one to push on a matter quickly."

Accounts & Finance.—These having been audited by Messrs. C. Lake and F. M. Hamilton and found correct were passed.

Payment of Delegate to the U. P. A. S. I.—Resolved that the Official Delegate of the U.P.A.S.I. Annual Meeting be paid the sum of Rs.100 and this resolution be added to the rules.—Carried unanimously.

Rules of the Association.—The Sub-Committee through Mr. C. Lake. then read out Rules as they advise they should stand. Each Rule was gone into one by one and discussed thoroughly. A vote of thanks having been passed to the Sub-Committee for the careful way they had gone into the question, it was then proposed by Mr. M. J. Woodbridge and seconded by Mr. E. W. Rutherford and carrid unanimously: "That the rules be adopted and the Honorary Secretary shall have the same printed in book form, in which the names and addresses of Members shall also be printed at end, but area, etc., of their Estate shall not appear."

Roads and Communications.—Resolved: "That the Postmaster-General be written to drawing his attention to the delay now taking place in delivery of Saklaspur mails owing to the decrepit state of the Tongas and deficiency of the ponies on the run between Hassan and Saklaspur and requesting him to give this matter his very serious consideration." Proposed by Mr. C. Lake, seconded by Mr. F. M. Hamilton.—Carried.

It was also proposed by Mr. Thomson, seconded by Mr. Woodbridge and carried: "That the Hanbalu Post Office be put in account with Mudigere as formerly." At present the tappal from Mudigere arrives about 6 p.m. while the tappal from Saklaspur does not arrive till 8 a.m. next morning which is a recent inovation. A letter from Mr. H. F. Anderson, was read complaining on the same score. He also gave other information to which it was suggested that the Honorary Secretary might write to the Secretary of the U. P. A. S. I. and ask if he had any information on the rumour or could find out if there was anything in it. Mr. F. M. Hamilton then spoke on the introduction of Labour Rules to regulate amount of advances, etc., amongst planters. It was ruled that it was not in order to discuss the matter from the point of view of the Labour Department, as with some of our members—subscribers to that Department and some not, it was a matter for subscribers only. And as regards introducing Labour Rules for our Association as a body, the opinion was that there was no need, and even if introduced they could not be enforced as the Labour conditions in Mysore were peculiar.

A vote of thanks to the old Executive having been proposed by Mr. Thomson seconded by Mr. Hayward and carried unanimously, balloting of office-bearers then took place, resulting as follows:—

President	...	M. J. Woodbridge, Esq.
Vice-President	...	C. Lake, Esq.
Honorary Secretary	...	A. Thomson, Esq.

After a vote of thanks to the Chair the Meeting terminated.

Shevaroy Planters' Association.

Proceedings of a Special General Meeting of the Shevaroy Planters' Association held at Yercaud, Victoria Rooms, on 13th April, 1915.

PRESENT.—Rev. Father Capelle, Messrs. E. Dickins, H. S. Dyer, R. A. Gilby, J. C. Large, K. Leeming, C. G. Lechler, W. I. Lechler, E. L. Poyser, C. Rahm, G. Turner and Chas. Dickins (Honorary Secretary). Mrs. Campbell by her Proxy Mr. R. A. Gilby, Mrs. Morris by her proxy Mr. R. A. Gilby.

1. The Notice calling the Meeting was taken as read.

2. *The Late Mr. Robert Gompertz.*—As soon as the Meeting had assembled Mr. C. G. Lechler in alluding to the death of the late Mr. Gompertz spoke as follows:—

Gentlemen,—I have been requested before we commence business to say a few words regarding the loss this Association has sustained by the death of Mr. R. Gompertz. Mr. Gompertz connection with these Hills, as a Resident Planter extended to a period of 30 years, during this time his activities bestowed not only to this Association but to I may say all the institutions of Yercaud have, as we all know, been ungrudgingly given. For years he acted as Honorary Secretary as well as Chairman of the Shevaroy Planters' Association, he also represented us for some years as our Delegate

to the Parent Association and having accompanied him to Bangalore several times, I can vouch for the painstaking and able manner in which he studied our interests there. I need hardly remind you how pleased we were when he was elected Chairman of the U. P. A. S. I. The Church, the Victoria Rooms, the Volunteers which he commanded for some years, local Gymkana and Dramatic Society—all testify to his able help and assistance in furthering the welfare and prosperity of Yercaud. We have not only lost a good friend, but also a companion mentally and socially hard to spare or replace.

His example as a thorough public spirited member of the Community always willing to give his time and ability to the services of the place and people—should be an incentive to other younger members to come forward and fill the blanks which have been so many during the last few years, on these Hills. Gentlemen, I would therefore propose that we pass this resolution :

"That the Members of this Association beg to express their deep sympathy with the family of the late Mr. R. Gompertz, whose loss we, as well as the Community generally, much regret." Mr. G. Turner seconded the resolution. The resolution was put before the meeting all standing, and was unanimously carried.

3. Election of a "Standing Labour Committee" to whom disputes under the Labour Department Rules should be referred, to whom the Labour Department may apply for guidance in matters concerning the District for which the Committee is appointed and with whom the Labour Department shall co-operate.

The following gentlemen were elected :

Messrs. C. Ryle (To represent the non-members of the Association)

„ C. Dickins „ G. Turner „ C. Rahm Revd. Father Capelle	To represent the Association.

Three members shall form a quorum.

Read letter dated 19th March from Mr. Day, Deputy Director, L. D. The Honorary Secretary was instructed to place the communication before the standing L. Committee at a meeting arranged for on 23rd instant.

4. *Coffee Contribution Fund.*—The Honorary Secretary was instructed to withdraw the amount Rs,71-6-7 (being value of triage and refuse coffee) from Messrs. Stanes & Co. and remit same to Editor, *Madras Mail*, as a donation from the Shevaroy Planters to the Serbian Relief Fund.

5. *The Widening to the Church of Lake Road.*—Read letter dated 14th January, 1915 from Mr. J. C. Large. Proposed by Mr. Large and seconded by Mr. Poyser : "That the Honorary Secretary be requested to approach the President of the Yercaud Union requesting that one of the side drains of the road from Lake View to Silver Oaks be filled with a view to widening the road.—Carried unanimously.

6. *The extension of the London Mission Burial Ground, Yercaud.* —Read and recorded letter dated 5th February, 1915 from the Collector and District Magistrate.

7. *Seat on the District Board.*—Read and recorded letter dated 26th February, 1915 from President, Salem District Board.

(Signed) CH. DICKINS,
Hon. Secy., S. P. A.

RUBBER.

The Rubber Industry in France.

It is to a Frenchman that the civilised world owes its earliest knowledge of india rubber and the peculiar properties to which its value in the arts and industries is due. In 1735, Charles Marie de la Condamine, a French military officer, visited South America for the purpose of making astronomical observations. Having concluded his work in Peru, he determined to return to the east coast by way of the Amazon River. This he did, travelling overland to the Andes Mountains and following the course of the various affluents of the Maranon and Amazon across the then unexplored Continent. He returned to France in 1763, and in a paper that forms part of the history of the Royal Society of France for 1745, gives an interesting account of his travels. He refers particularly to "cahuchu," the modern rubber, and describes the bottles, syringes, etc., the natives made from this remarkable substance.

In the history of the Academy for 1751, there is published another paper by M. de la Condamine, devoted entirely to rubber, in which he gives further particulars in regard to "caoutchouc" and describes the travels and researches that led to the discovery of the trees from which the South American natives extract the gum, in the French colony of Guiana. Illustrations of the tree, its foliage and fruit and of the method of tapping it, accompany this paper.

While thus, from the scientific standpoint, a leading place in the history of the rubber industry belongs to France, the name "caoutchouc" being in itself a reminder of the fact, the growth of the rubber manufacturing industry in that country has been slow compared with its progress in other lands. This may be in part ascribed to the tendency of the French manufacturers to specialise in certain lines, thereby neglecting or losing sight of opportunities offered in other fields. Small articles, such as toys, tobacco pouches, articles of female apparel, elastics, etc., have largely occupied the attention of the French manufacturers, whose pre-eminence in their production is reflected in the character of their exports. For the more serious lines of mechanical rubber goods, the army and navy and the great railroad corporations have been the largest customers, private buyers, such as manufacturers and others, preferring the products of foreign countries, notably of Germany and England. The production of hard rubber articles, on the other hand, has been brought to a high degree of perfection in France, Paris carrying on this business extensively, especially in connection with scientific and surgical instruments, mouthpieces for pipes, toilet goods, etc.

The importation of crude rubber affords a practical criterion as to the growth of the French rubber manufacturing industry. In 1836, France imported 72.000 pounds of crude rubber, in 1862, the quantity entered had increased to 1,8000,000 pounds, in 1870, it was 2,500,000 pounds, and in 1890, upwards of 4,000,000 pounds. In the year 1900, the imports of crude rubber were 6,285,314 pounds, and while some of this was re-exported in an unmanufactured state it was for the greater part used in French factories.

The manufacture of rubber goods was established in France as an industry in 1828, the Michelin rubber-goods factory at Clermont—Ferrand dating from that year, being the oldest in that country. This concern was also a pioneer in the manufacture in France of rubber tires and rubber goods for flying machines. For the reason above stated and because there was less call for rubber goods in France than in many other countries, the progress of the industry has been gradual, and it has never attained the same importance as in England and Germany.

An important factor in the encouragement of the rubber manufacturing industry in France was the prominence given to rubber at the great exhibition held in London in 1851. The exhibit of Charles Goodyear, who had shortly before perfected his process of vulcanizing rubber, consisting of household furniture, decorative objects, jewelry, culinary and household utensils, toilet articles, clothing, footwear, etc., attracted wide attention and served to show the infinite variety of purposes for which rubber could be used.

One of the lines that early engaged the attention of the French manufacturer was that of rubber boots and shoes. In some parts of France—Brittany for instance—the prevalence of rainy weather led to a steadily increasing demand for rubber foot-wear and waterproofs. To supply a deficit, rubber boots and shoes were imported and the American article, owing to its superior fit, style and wearing properties, speedily won the favour of buyers. This resulted in a growing importation of the American product which finally attracted the attention of Hiram Hutchinson, who having established a small rubber manufacturing plant at New Brunswick, New Jersey, subsequently took part in the formation of the Newark Rubber Co. He visited France to arrange for the purchase and exploitation of the Goodyear vulcanization patents on the Continent. In 1853, while in Paris, he prospected for an eligible site for a rubber goods factory and finally decided on a place about three hours' journey from the capital, now known as Langlee in Chalette, near Montargis. The availability of a water-power right and fact that near by communities promised plenty of labour were factors in the selection of the site. Here was located the beginning of one of the most important rubber manufacturing enterprises in France, where, in addition to rubber footwear of world-famous excellence, rubber tires and an endless line of rubber goods of every description are made.

In 1869, Hiram Hutchinson, the founder, died, but the concern had already been incorporated and Alcazar Hutchinson, his eldest son, succeeded him. In 1872, Mr. H. P. Moorhouse, went over from the United States and reorganised the concern, which assumed the present title of A. Hutchinson & Co. With the decease of Mr. A. Hutchinson, about 1889, the last of the members bearing the name had passed from the firm, and in 1898, Mr. J. Kennedy Smyth, who had been associated with Mr. Hutchinson in the foundation of the enterprise, died. He is believed to have been the last of the original subscribers to the successful concern, which is now conducted as a corporation, with a capital of, $650,000.

French rubber goods factories have steadily increased in productive capacity, due to completeness of equipment, rather than in size of number, the latter part of the nineteenth century witnessing the most important development in the industry, which had reached a highly prosperous condition as early as 1875. In 1863, the Syndicat Professionel of the india rubber, gutta percha, oil cloth and imitation leather industries was founded, marking quite an important epoch in the rubber trade. Partaking of the nature of a guild, it takes cognizance of customs and freight tariffs, industrial legislation and all matters affecting the interests of the trades it represents. About this time, too, a tendency to generalise in the manufacture of rubber goods developed: the compounding of rubber substitutes became more common. This necessitated changes in the machinery and equipment, and while making these alterations manufacturers installed necessary apparatus for extending the scope of their operations and the variety of their productions.

The period immediately preceding the commencement of the war probably witnessed the greatest prosperity in the history of the French india rubber interest. The growth of the automobile industry had lent a notable impulse to the business of manufacturing rubber tires, almost if not quite sufficient to counter-balance the depression that had existed in the mechanical and surgical rubber goods branches; and the year 1914, but for the demoralization of business due to the outbreak of hostilities, would have ended as one of the best the French rubber industry has ever seen. During the past year tires of every description have occupied a conspicuous place in French rubber manufacture. The large and increasing demand from the home market and the facility with which an export trade could be established, has induced many French manufacturers to add tires to their regular output and there has consequently been a large increase in the number of tire munufacturers in France. Statistics for 1913, show the value of tires exported to have been about $18,000,000. Figures available for the months of 1914, prior to the war are uncertain, but the incomplete figures published relating to the first half of 1914, show an increase, as compared with the same period of the preceding year.

With the opening of the year 1914, France had at least 20 prominent tire works, but few of these were known outside the country. The few, however, that enjoyed international fame ranked with the foremost companies in existence and where selling their tires all over the world, wherever there are motor cars. The present war between France and Germany was preceded by a fierce commercial struggle between leading German tire manufacturers and prominent French firms. It began with a price policy controversy and terminated in a boycott instituted simultaneously by both sides. The trouble was in part carried into English territory and for a time caused serious trouble in the British tire trade.

As present, the manufacture of tires appears to absorb the greater part of the producing energy of the French rubber industry. The latest French rubber trade directory shows 110 companies, large and small, engaged in in the manufacture of rubber tires and hose. Not all are strictly French, some being foreign houses having manufacturing branches in France, and some of the companies referred to as tire manfacturers make them only as a side line. The comparison of this figure with that for other branches of the industry is interesting. There are, for instance, 19 companies manufacturing rubber balls, 3 making tobacco pouches, 49 garters, suspenders, etc., 10 making dress shields, 1 making rubber sheets for copying presses, and 4 making rubber thread. Nearly 30 firms make waterproof cloth and 8 are making rubber footwear. It will be seen that with the exception of mechanical goods, French firms manufacture all lines. There has nevertheless been a large demand for foreign goods which has been met by Germany and England.

From the first named country the imports have amounted to $4.000,000 a year, so that France has been a good customer of the German rubber industry, while Germany's purchase of rubber goods from France amounted only to about $1,000,000, mostly for tires. French manufacturers have made but little systematic effort to introduce their goods, with the exception of tires, into foreign markets. The business that has come to them has been chiefly of a fortuitous character, no French rubber goods manufacturer, outside of a few large firms, having made any attempt to maintain systematic foreign representation. French rubber goods have found for years a natural outlet in the Balkans and Egypt, but of late these markets have been vigorously contested by Germany, Austria and England, and in one of the most favoured of French goods, rubber shoes, Russia has become a keen competitor.

Imports of rubber goods by France include rubber thread, to the annual value, normally, of about $1,000,000, and elastic cloth materials to about half this amount. Dress shields are imported to the number of 100,000; garters, suspenders and hose supporters to the value of about $30,000, and cloth material to the value of $150,000. Rubber boots constitute an important item in the list of imports, amounting in value to $200.0000, The exports of rubber footwear from the United States to France has reached a total annual value of $23,667. Tires and hose, constituting the most important item in the French imports of manufactured rubber goods, amounted last year to about $5,000,000 in value; for the year ending June 30, 1914, the United States sent automobile tires valued at $5,448 to France and other kinds of rubber tires to the value of $15,284. Goods manufactured from rubber and other materials such as belting, hose, packings, etc., were imported by France last year to the value of about $2,400,000, articles of this class to the value of $62.319 being supplied by the United States. As against these imports there has been devoloped a very considerable export trade in a number of lines. The value of the exports of elastic materials, for instance, is about $6,000,000 a year. Proofed garments are exported to the value of nearly $2,000,000 and $1000,00 worth of rubber boots are sold abroad. Tires, hose and similar materials to the value of about $18,000.000 are sent to foreign markets, leaving a tire balance of $13,000,000 in favour of France, while belting, etc , exported reaches a value of above $3,000,000.

The depressed condition that prevailed in most of the Europen markets during the first part of 1914, was not without its effect on the French imports of rubber goods and, to judge from the meagre material at hand, there has been a decrease in most of the import lines. Since the commencement of hostilities there have been, of course, no exports but, all things considered, the industry had done well up to the end of July and had at least kept up the average of the preceding year, the decrease on one side being balanced by an increase on the other.

Paris is the chief seat of French export trade. Most of the leading manufacturers have some form of representation there, and are thus able to get in touch with foreign buyers visiting the city, or can readily reach export houses serving the French trade and conducting business especially with South America, Russia, and what is known as the near-East, meaning the Balkans, Asia Minor and Egypt.

While we may estimate the number of leading firms acting as importers, exporters, wholesale or large retail distributers of manufactured rubber goods in France as from 150 to 200, it is possible that the actual number is much larger and it is difficult to draw the line in such an estimate. There are altogether in France about 50 large firms importing raw rubber, about six being located in Havre and an equal number in Bordeaux. All have branches in Paris, Roubain, Marseilles and a few other places where markets for crude rubber are desirable.

France, in 1913, imported foreign crude rubber to the value of $40,345,100 and retains annually a considerable portion of the rubber coming from her own possessions. The exact value of the exports for 1913, is quoted as $24,405,000, so that about $16,000,000 worth of rubber was retained for home manufacturing purposes. Imports and exports of crude rubber fell off somewhat during 1914, and figures for the period since the war began have not been made public. For the first eight months of 1914, the French imports of unmanufactured rubber amounted to 29,932,744 pounds, compared with 31,922,736 pounds for the same months the year before.—*The India Rubber World.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 18.] MAY 1, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish to-day the "Past History" of the Scientific Department, bringing it up to date. It should prove interesting, not only from a retrospective view, but the future promises held out, if well supported by District Associations, and those firms and friends allied to all our Planting Industries, a magnificent prospect. It behoves all planters to induce such firms and friends to support the scheme that has been placed before the Madras Government. It will be seen from what small beginnings our Scientific Department began, and how the volume of business has increased. Agricultural Science is a progressive Science, and it has been continually inculcated in this paper, the value of Scientific advice in every step taken by planters. Recognising this, the United Planters' Association of Southern India should strain every nerve to find the funds necessary to accept the very handsome and generous offer of the Madras Government to take over our Scientific Department.

Important and valuable as is the Labour Department, it sinks into insignificance compared to the Scheme put before the Madras Government for establishing and running the Scientific Department on a broad and permanent basis. We especially call attention to the proposed Reorganization of the Department on page 233, and hope confidently that Delegates to the Annual General Meeting, in August, will come armed with full authority and determination to carry the scheme through.

Under the heading of "Labour Department" we publish the Labour Department Accounts from July 1st, 1914, to March 31, 1915. Considering the very grave financial difficulties that have occurred during the first year of the existence of the Labour Department, subscribers and non-subscribers must heartily endorse the resolution passed by the Control Committee "as to its sound financial position."

The Director of the Labour Department asks us to insert the following notice:—"The Director of the Department proposes to visit Coorg District arriving at the Club, Pollibetta, on the 11th May, putting in three days there, and then going on to Mercara Club for three days. He will be glad to meet subscribers and transact any business required. He is due back in Bangalore on the morning of 20th May."

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Past History.

The history of the Scientific Department of the United Planters' Association of Southern India would appear to begin in 1894, when it was suggested that the Association should engage the services of an Agricultural Chemist to tour in the various planting districts, advise what manures were necessary for particular soils, and make analyses of soils and manures. It was considered, however, that such a scheme would cost too much and it was decided to approach Mr. D. Hooper of Madras, and ask him if he would be prepared to reduce his terms for analyses if the whole work of the Planting Community was given to him. Mr. Hooper replied that he was not prepared to do this, and he was then asked if he could quote a lower rate for his analyses, provided he had a sufficient number placed in his hands during the course of a year. Failing this, it was suggested that the Association should pay him a retaining fee each month, a reduction being made on all analyses sent to him by any member of a District Association subscribing to the United Association. Mr. Hooper, naturally asked for an estimate of the amount of work that would be likely to be required from him each month, but this information was never given and the matter was dropped.

Nothing more appears to have been done till 1897, when the question of an Agricultural Chemist was again raised and the following resolution was passed :—

> "That the Secretary be instructed to ascertain what each District"
> "Association would be prepared to subscribe annually towards"
> "defraying the salary of an Agicultural Chemist to be employed"
> "for the purpose of directing cultivation with the object of com-"
> "bating leaf disease and other pests; to ascertain what the Gov-"
> "ernment of Fort St. George and those Native States in Southern"
> "India interested in the matter are prepared to give towards the"
> "same purpose. That in the event of the replies proving satis-"
> "factory a donation of Rs.2,000 per annum, if necessary, be given"
> "from the Reserve Fund for this purpose, and that the Secretary"
> "do ascertain the expense of employing a thoroughly qualified"
> "expert and communicate the result to the District Associations"
> "concerned."

Again this attempt led to no result. Most of the Planting Districts were apathetic and unfavourable replies were received from the Governments both of Madras and the Native States.

In 1898, however, the Mysore Durbar appointed Dr. A. Lehmann, Agricultural Chemist in charge of their Agricultural Department and the planters in Mysore State benefited to a great extent by his advice. Dr. Lehmann attended the Annual Meetings of the U. P. A. S. I. and delivered lectures on several occasions. His appointment was terminated in 1908.

In 1901, the Association requested the loan of the services of Dr. Watt, Economic Reporter to the Government of India, for the purpose of investigating plant diseases and pests, but his services could not be spared and the Government suggested the employment of the Government Botanist, or reference to Mr. de Niceville, the Entomologist to the Imperial Museum at Calcutta. The latter gentleman having arranged to pay a visit of inspection to the South Indian Tea districts unfortunately died,

In 1903, a tour of some of the planting districts was made by Prof, Lefroy, the Imperial Entomologist, and Dr. Barber, the Government Botanist, who issued reports and gave general advice. Dr. Butler, the Imperial Mycologist also visited the Wynaad to investigate a disease on the Pepper Vines there.

In 1904, an important advance was made. The Mysore planters proposed for the first time the establishment of an Experimental Station in some carefully selected locality supported by contributions from the planting community generally. The object originally was apparently to more especially study the hybridisation of Coffee and other products at this Station, but also to experiment with manures and new products.

At the Annual Meeting in 1906, a definite scheme was laid before the U. P. A. S. I. by the Mysore Associations for the establishment of the Farm and its objects. The United Association was asked to take over the control of the Farm and contribute Rs.2,000 per annum towards the Rs.10,000 it was estimated it would cost. After much discussion the United Association refused their financial support, but agreed to take the matter up and ascertain whether the Scheme would get the necessary support from Government and District Associations and if so to organise and control it.

At this stage, however, it appears to have been argued that it was best to get a man first and have a Farm afterwards and, consequently, at the Annual Meeting in 1907, we find that nothing was said at all about the Experimental Farm, but the following resolution was passed :—

> " That in view of the valuable financial support promised by the various South Indian Associations who had reported on the matter, and the urgent need of a Scientific Officer to advise and help the various branches of the planting industry in South India, the U. P. A. S. I. do approach the various Governments for financial assistance to enable the project to be carried through at an early date."

The " valuable financial support promised by the various Associations" of this resolution appears to have amounted to Rs.2,069 for five years only, but one or two Associations were not included and it was decided to go to Government with this sum and ask for more to enable the Association to have a scientific adviser devoted entirely to the Planting Industries. Estimates of cost were discussed in detail and it was finally decided " that the Government of Madras be requested to lend a properly qualified officer to carry out the necessary work entirely under the control of the U. P. A. S. I. for three years, and that after ascertaining how much assistance can be obtained from the Imperial and Mysore Governments and planters themselves, the sum so collected be tendered as a contribution towards the outlay."

The Government of Madras showed themselves in sympathy with this scheme, which was estimated to cost Rs. 12,000 per annum for five years, and in 1908, the District Associations agreed to contribute a sum of Rs. 3,040 per annum for five years towards the scheme, Coorg and the Native State Governments of Cochin, Travancore, and Mysore between them a further sum of Rs. 4,500 for five years. This promise was finally made to the Government of Madras and an Agricultural Chemist asked for. In 1909, a Scientific Officer was appointed in the person of Mr. R. D. Anstead, whose services were formally lent by the Government of Madras to the United Association for five years.

Development and the present state of the Scientific Department.

In 1910, a combined office for the Secretary of the U. P. A. S. I. and the Scientific Officer was established in Bangalore and the library was arranged and catalogued and brought up to date by the annual purchase of books. The *Planters' Chronicle*, the official organ of the United Association, was changed from a monthly periodical into a weekly and in 1912, taken over entirely by the Association. In 1914, it yielded a revenue of Rs.1,525 to the funds of the Association.

In 1911, a small laboratory was equipped for the use of the Scientific Officer in rooms adjoining the office. Meanwhile the Scientific Officer visited all the planting districts with which the U. P. A. S. I. is concerned and made himself as thoroughly conversant as possible with the local conditions prevailing in each District, the local problems connected with the crops grown, and gave what advice he could on the spot. A number of field experiments were started in connection with manurial problems and methods of cultivation were improved in many instances. An ever growing correspondence with planters was maintained covering a wide field, and dealing with manures, cultivation, new products, pests and diseases, &c., &c.

The District proved far too large and the work required too much for one man to deal with and Assistants were asked for. In 1912, the Mysore planters, as usual leading the way, appointed Mr. G. N. Frattini to be their Assistant Scientific Officer, to reside in the district and aid in carrying out experiments, visiting estates, etc.. In the following year, a small laboratory was established for his use. This Assistant and the upkeep of his laboratory, &c. is entirely paid for by the Mysore Associations and an agreement was made with Mr. Frattini for five years. At the present time he still holds the post.

In 1913, the Coorg planters followed Mysore's example and appointed an Assistant Scientific Officer for Coorg in the person of Mr. L. G. Jonas. Unfortunately Mr. Jonas was not a suitable man for the work, and at the end of the year he resigned, and at present no successor has been appointed.

The five year period for which Mr. Anstead's services were lent by the Government came to an end at the beginning of 1914, and he proceeded to England on leave. Meanwhile, the Government of Madras were asked to continue the loan of his services for a further period of five years.

Before proceeding on leave, Mr. Anstead speaking at an Extraordinary General Meeting of the U. P. A. S. I. held in Bangalore on 11th and 12th March 1914, said :—

"When I took up the post of Planting Expert, I understood from the Secretary of State that part of my duty was to advise the U. P. A. S. I. whether it was to their advantage to have a Scientific Department of their own, and, if so, on what lines it should be run, and after that to organise such a Department.

"I have now nearly completed the five-year term for which my services were lent to the U. P. A. S. I. by the Indian Government, and I am about to to proceed on leave, and this Meeting appears to be a suitable opportunity to lay my views before you with regard to the future of your Scientific Department, which I have had the pleasure of starting in a very small way.

"When I arrived, the Association had not even an office of its own. To-day we have a fine office in a central position in Bangalore, our official publication has been made a weekly and is yielding a revenue to the Association estimated this year at Rs.1,500. A laboratory has been established

and equipped and has been in use during the past three years. The library has been arranged and catalogued. One District at least has a Scientific Assistant of its own, while another district will shortly have a similar Assistant working under similar conditions, their first essay in this direction having met with disaster, owing to the engagement of a man who unfortunately proved to be unsuited to the work.

"During the past five years I have visited all the planting Districts with which the U. P. A. S. I, is concerned. Many of them I have visited several times. I have endeavoured to make myself as thoroughly conversant as possible with the local conditions prevailing in each district, the local problems connected with the crops grown, and to give what advice I could on the spot with regard to my own particular line of work, agricultural chemistry. A number of field experiments have been started in connection with manurial problems, and methods of cultivation have been improved in many instances. In fact, purely chemical problems have been as thoroughly dealt with as possible and outstanding problems are now on the way to solution. The problems left are of two kinds, first those which need for their solution research work in the laboratory, backed up by careful experiments in the field, both of which lines of attack necessitate time and leisure. Secondly, problems connected with plant diseases. The majority of the diseases causing loss to the planters of South India are caused by Fungi. For the study of these the services of a well-trained Mycologist is, in my opinion, absolutely necessary. Personally, I am a chemist and my knowledge of Mycology is small, and I am certainly not in a position to take up the technical research which is necessary to deal with this part of the work of the Department.

"This, then is the position to-day, and when you consider the future of your Scientific Department for the next ten years or so, I beg to ask your careful consideration of the following points which are based upon the experience I have gained while working in the planting districts with which this Association is concerned. My advice, gentlemen, is as follows:—That it is essential for the U. P. A. S. I. to have a Scientific Department of their own, but that department must be a well-organised one and thoroughly well equipped, both in laboratories and staff. I feel sure that any sum up to Re.1 per acre spent on such a Department would be a paying concern and the money would be saved time and again. The present arrangement, is, however, in my opinion, quite inadequate and useless, and unless, the existing Department is re-organised and enlarged, no advance can possibly be made. This being so, I suggest that a Scientific Department should be organised on the following lines.

(1) "An Agricultural station should be established. In my opinion this is essential. The difficulty of carrying out field experiments, which must often be continued over a long period of years under most careful supervision, on estates is insurmountable. In the first place there is a great reluctance among planters generally to carry out any organised experiments, and during the rush of work at crop time and other seasons the experiments are invariably neglected. I do not mean to imply for a moment that the planter is to blame for this. I think it must necessarily be the case and I do not think that any experiments carried out here and there on estates can ever yield results worth anything. Too much risk is run from want of continuity alone. The proper place to carry out experiments is at an agricultural station, where they are under the eye and control of the Scientist who is conducting them.

"Therefore, I contend that the U. P. A. S. I. must establish such a station. Bangalore is quite an unsuitable place for obvious reasons. I believe Coimbatore has been suggested, but that is equally unsuited for growing Coffee, Tea and Rubber, the three main crops in which we are interested. It is true that at Coimbatore your staff would be in close touch with the Scientists at the Agricultural College and Research Institute, which would no doubt be a great advantage, but I feel that it is necessary that the laboratories and headquarters of the Department should be at the Agricultural Station itself, where the crops grown are close at hand and laboratory research and field practice can go hand in hand. This must be so, in fact, if any reliable results are to be obtained and good work done. Again, the agricultural station should not be far from a railway and telegraph centre, since with a big area of country to deal with a large amount of touring will always have to be done by the officers in charge. The most suitable place I can think of is the Nilgiris, somewhere in the neighbourhood of Ootacamund, where both tea and coffee can be grown, while rubber is within easy reach on the Kotagiri side. A laboratory would have to be built, but quite a small building is all that is necessary. The laboratory will necessarily have to be moved from Bangalore and the Secretariat office would then be moved into smaller quarters and a saving thus effected.

(2) "The services of a Mycologist should be obtained. At the Annual Meeting in 1913, the following resolution was passed :—

> 'That this Association considers that the services of a Mycologist under the direct control of the U. P. A. S. I., is necessary. That there is need for such an appointment is apparent from the subjoined list of diseases on which investigation is required, and that the Hon'ble Mr. Barber be asked to urge the matter on the Government.'

"The Government reply was as follows :—

'With reference to your letter dated the 8th September, 1913, forwarding the Resolution passed at the last Meeting of the United Planters' Association of Southern India on the subject of employment of a Mycologist under it and to the Hon'ble Mr. Barber's letter of the 17th October, 1913, suggesting the name of Mr. Shaw, the Supernumerary Mycologist in that connection, I am directed to state that the Government recognise the useful results which might follow the appointment of a skilled man to investigate problems connected with diseases affecting the coffee, rubber and tea estates in Southern India. They, however, understand that it will not be possible to obtain Mr. Shaw's services, as he is to act for Dr. Butler, the Imperial Mycologist for a period of eighteen months or so, and it is not probable that the services of any supernumerary could be secured for continuous employment under the Association. In these circumstances, if an expert is to be provided, he will have to be brought out from Home on a five-year agreement, as the problems confronting the planters will occupy a trained European Mycologist for at least that period. It will probably not be possible to obtain a suitable officer on a salary of less than Rs. 700 per mensem, and the total cost, inclusive of travelling and other expenses of the officer, may be estimated at Rs. 12,000 per annum. The Government are inclined to think that the best plan would be for the United Planters' Association to get out a man from England on its own behalf, in which case Government would be prepared to consider whether any and, if so what, contribution towards the cost of the scheme should be provided from provincial revenues. It is possible that contributions might also be obtained from other sources such as the Mysore

Durbar, and the Government are making enquiries on this subject. Before coming to any decision, the Government would be glad to know whether the above suggestion commends itself to the Association, and what proportion of the expenditure on account of the proposed officer the Association would be prepared to bear.' "

(3) " The line taken by Coorg and Mysore in employing Scientific Assistants of their own to work locally in their Districts should be further developed. A man to work at rubber problems in the Rubber Districts themselves is badly needed, and I suggest that a Rubber Growers' Association of Southern India be formed permanently for this purpose and for the study of modern methods of rubber cultivation and manufacture in a scientific way, as is being done in the Malay States and Ceylon. At present the Scientific Department is crippled by want of staff. It consists practically of one man only, and it is impossible for him to do any real work or concentrate upon any one problem, because of the multitude of interests that have to be dealt with, and the mass of correspondence that passes through the office. My duties during the past five years, correspondence, advising about manurial systems, touring, writing articles for the *Planters' Chronicle*, etc., have become so numerous, and daily absorb so much time, that I find it quite impossible to do any serious work or even to attempt research on the many interesting problems which are waiting to be solved, and which I am longing to tackle. Without any increased staff it is impossible to get the best results out of your Department."

" The suggestions I have had the honour to make, if carried out, will I firmly believe, go far towards making the Scientific Department of the U. P. A. S. I. a valuable asset, and any money spent on it will pay a high rate of interest in increased knowledge and, therefore, increased planting prosperity. Labour troubles are increasing all over the world, and though a Labour Commission will undoubtedly go far to solve the problem as it affects the planters of Southern India, I believe that the solution for planters all over the world will lie along lines of concentration of labour on small estates which by means of high cultivation and scientific knowledge will be made to produce from an acre crops which are now only produced from ten acres, and when that day comes the full benefit of an efficient Scientific Department will be felt, and the planting communities who had forethought enough to establish such departments and give their Scientific Experts facilities for work will reap their reward."

It was suggested by the Director of Agriculture who was present that possibly the Government would be willing under certain circumstances to take over the Department and thus continuity would be gained. At the Annual Meeting in 1914, this proposal was left for the District Associations to consider with the idea of definitely settling the matter at the Annual Meeting in 1915.

The Proposed Re-organisation of the Department.

On the return of Mr. Anstead from leave, the matter was definitely taken up and a Committee consisting of Messrs. J. A. Richardson, E. F. Barber, C. E. Abbott, and C. H. Browne appointed to settle details as far as possible. A meeting was held on 24th March, 1915 in Madras at which both the Director of Agriculture, Mr. D. T. Chadwick, and Mr. Anstead were present and a definite scheme was drawn up to lay before Government.

The Government have asked the United Planters' Association in future to contribute a sum of Rs.15,000 annually for five years, in return for which they are willing to take over the Scientific Department and run it on improved lines,

The difficulty of finding a locality for a central Agricultural Station which is suitable for growing all the crops in which South Indian Planters are interested proved insurmountable. The Committee unanimously agreed that more valuable and more immediate results would be obtained if it were possible to open experimental stations for the different crops in the localities where these crops were most widely cultivated and were of the first importance. In the plains one Deputy Director controls four or five agricultural stations each of which is in charge of an Indian Superintendent who has been trained at Coimbatore or Saidapet. He sends his Deputy Director a daily report of what has been done or has occurred on the station besides other straight forward returns so that the Deputy Director is kept up to date with all occurrences. Similar men could be obtained for the management of stations in the planting districts. The Committee therefore decided to work out the cost of a scheme based on such proposals to place before Government.

1. They considered that the establishment of six Experimental Stations would meet existing needs, *viz* :—

Two for Tea, one in Peermade and one in Wynaad.

Two for Rubber, one in Malabar and one in South Travancore.

Two for Coffee, one in Mysore, or Coorg, and one in the Shevaroys.

But if on account of expense these had to be reduced then the one in the Shevaroys and the one in the Wynaad could be dropped in this order.

The object of the work on the stations would be the experimental study of cultivation and manures and the study of the life histories and methods of control of pests and diseases. Questions of plant breeding and quality, and manufacture of products will be left for the present.

The Stations will be controlled and regularly visited by Mr. Anstead from Bangalore, which will continue to be his headquarters. The office and laboratory at Bangalore will be maintained as at present.

2. The appointment of a Mycologist recruited from England to devote his time to the study of fungoid diseases of Southern Indian crops. He will be stationed at the Peermade Experiment Station as headquarters where a bungalow and laboratory will be built for him and from there, he will tour the districts and conduct field work.

Each Experiment Plot will cost from Rs,2,000 to Rs.2,500 to establish and about Rs,3,000 per annum to run. It is proposed to make each consist of 20 acres of established crops and it is hoped that the land will be given free of charge in return for the produce from each station at a nominal price.

The total cost of the scheme is estimated to be as follows :—

	Initial cost.	Annual upkeep.
	Rs.	Rs.
2 Rubber Stations ...	5,000	6,168
2 Tea Stations ...	4,000	6,000
2 Coffee Stations ...	5,000	5,368
Mycologist ...	10,500	12,000
Planting Expert ...	—	13,500
Bangalore Laboratory ...	—	1,500
Total Rs...	24,500	44,536

or in round figures, to be on the safe side, an initial cost of Rs. 25,500 and an annual charge of Rs. 47,000.

After the meeting, Mr. Richardson and Mr. Barber accompanied by Mr. Chadwick laid the proposals before the Hon'ble Mr. A. G. Cardew, C.S.I. The Honourable member said this was a new scheme differing from the one that had previously been put forward, but that the general idea underlying these last suggestions appealed to him. He was prepared to see what could be done when the full papers reached him. But they would readily understand that on account of the war and the consequent diminution of the Revenue, it would be impossible for the Financial Department to find the necessary funds during the current year, 1915-16; he hoped, however, that the scheme would prove feasible and could be sanctioned in the near future. It was, however, going to cost money and if funds were not readily available it might be necessary to reduce the number of the stations to five or four. He suggested to the deputation that they should consider this possibility in locating the stations.

This is a big scheme, far bigger than that which was contemplated six years ago before Mr. Anstead's services were engaged, and is even more expensive than that which was put before the last Annual General Meeting. On the other hand it appears more practical and to have more promise of benefit to the planting community than any other suggestion that has yet been put forward, and for this reason is more likely to commend itself, not only to the Madras Government, but to the Durbars and to Planters themselves.

Government originally proposed that the U. P. A. S. I, should find Rs.15,000 itself, exclusive of any contributions that might be made by the Native Governments and the Administration of Coorg; this was not rightly understood when the matter was discussed at the last General Meeting, but now it has been made clear to the Hon'ble Mr. Cardew that it is impossible for the U. P A. S. I. to guarantee more than Rs.10,000 a year, and that it can only do this by inviting Firms directly interested in planting to help with contributions.

At present the contributions from Coorg and the Native States amount to a little under Rs.5,000, but it is thought that this scheme, which places planting problems in South India on one footing, and which allows of the distribution of these Experimental Stations where they are most wanted, without regard to territorial limits, will prove more attractive and should induce larger contributions.

Apart from this, the competition among the suppliers of manures should lead to a certain amount of manures required for the stations being supplied free of cost.

It has been stated before that no further contributions were to be asked from the District Associations, but the finding of the necessary money will tax the resources of the united Association to the utmost, so it is to be hoped that, each Association and every member will spare no efforts to induce outside contributions.

Although this scheme is in advance of anything hitherto put forward, it should not be looked on as a complete scheme. If in its present form it proves a benefit to the planting community, developments are bound to come in time, and it may be considered that the two Europeans and six Indians form only a nucleus of the staff of trained men who will devote their time to the study of planting problems in South India.

LABOUR DEPARTMENT.

In accordance with the instructions of the Control Committee the following accounts are now published :—

Labour Department Account.

	Rs.	A.	P.
Amount actually received from Subscribers (3 quarters)	1,38,143	2	7
Balance due by Subscribers on 31st March 1915	7,702	5	8
Total Rs...	1,45,845	8	3

Receipts.— *Dr.*			
Amount received from Subscribers as above	1,38,143	2	7
Subscription received in advance for 4th quarter	944	0	0
Interest from Bank	134	7	11
Sundry Creditors	2,593	13	8
Total Rs...	1,41,815	8	2

Income account.—	Rs.	A,	P.
Area subscribing 1st quarter 97,216·145 acres @ As. 8 per acre	48,608	0	9
Area subscribing 2nd quarter 97,215·525 acres @ As. 8 per acre	48,607	11	9
Area subscribing 3rd quarter 97,259·525 acres @ As. 8 per acre	48,629	11	9
Total Rs...	1,45,845	8	3

Expenditure — *Cr.*			
Amount spent by Secretary and Director...	83,637	3	1
Cash with Mercantile Bank	35,343	11	5
,, Bank of Madras	10,972	7	1
,, Secretary	1	4	6
,, Director	459	13	8
Sundry debtors, being advances for motors and bicycles, etc.	11,401	0	5
Total Rs...	1,41,815	8	2

Bangalore, 15—4—15.

AYLMER Ff. MARTIN.

With reference to the above accounts, the Control Committee of the Labour Department passed the following Resolution :—

"The Control Committee places on record its satisfaction at the sound financial position of the Labour Department and instructs the Secretary to publish the Balance Sheet as on 31st March, 1915.

Since 31st March, a further sum of Rs.1,519-13-8 has been received leaving a balance of *Rs.6,812-13-8* to be collected on the first three calls.

FLETCHER NORTON,
Secretary.

TEA.

Boom in Tea.

Common Grades not the Cheapest.

(From *The Daily Chronicle.*)

Several factors have contributed to an increased consumption of tea, huge quantities of which have been taken out of bond during the present month.

The amounts released do not altogether indicate the volume of immediate requirements, great as this is, for stocks have been shifted and duty paid, so as to be on the safe side in the event of further war taxes. All the same, the figures are significant, reaching record proportions.

The tea taken out of bond in the first 15 working days of March totalled no less than 25,179,588 lbs. as compared with 14,076,852 lbs. for the first 14 working days of the previous March. That is to say, a year ago, tea was poured out of bond at the rate of one million pounds daily; and the outflow latterly has been, broadly, on a daily scale of upwards of 1½ million pounds.

Of the 25 million lbs., 21½ millions have been ear-marked for home consumption and 3½ million for export, whilst 12 months back nearly 12 million lb. were allotted to home consumption and two million lb, or so to export. Though a dividing line may not be drawn with exactitude between the quantities of teas absorbed by immediate necessities and the balance of stocks which have been transferred from bond on grounds of expediency, the evidences of growing sales are none the less notable.

A Rival to Beer.

Tea is more in demand as a rival to beer, though both have to bear a war tax, the curtailment of licensing hours having naturally a bearing on the situation; there is a consistently large despatch of tea at fixed periods for troops on active service; and then the position of the soldier's wife who is drawing a separation allowance with clockwork regularity makes for increased purchase of tea for her home.

Where True Economy Lies.

In this connection point may be made of a fact which is often overlooked. Whatever the quality of the tea purchased, and whatever the price paid, the duty per lb. is always the same. It stands at 8*d*., as 11 years ago, and the housekeeper who goes in for a low price article obviously has to contribute a higher percentage of duty.

Suppose, for example, that a customer obtained a tea at 1*s*. 4*d*. per lb., the result would be that out of every 4*d*. paid for the ¼ lb. 2*d*. would go to duty and the remaining 2*d*. would represent the money actually to be set against the value of the tea.

The price mentioned is not a trading figure, and yet even on a public body the argument has been pressed to the contrary, ignoring the effect of the added war charge. It is held by experts to have been a false move advancing tea by only 2*d*. per lb. when there was the extra 3*d*. duty; and though this may not at first glance seem acceptable to the careful housewife, the argument strengthens as it points the direction in which true economy lies.

The low price tends to the detriment of quality, which has to be reduced to furnish an article at the figure—though at the outset the public were ready to pay the extra 3*d*. The man in the street gets a wrong impression regarding the apparently cheap tea for which prices have been

forced down—and quality as well—overlooking the fact that material is often used for reducing purposes which in normal times people would not drink. That is not good for the customer or the trade.

Mistaken "Cheapness."

Why buy common tea? It is not cheap, but really dearer than a fine 2*s.* tea, which at the present time is cited as a good basis.

In comparison with previous years, allowance has always to be made for the additional tax now imposed; and when it is demonstrated that the 2*s.* article will yield 280 afternoon cups of tea, whilst the lower grades will furnish only 220 cups, it is obvious that the better article is the cheaper, affording greater value for money.

The comparison of cost per 20 cups may be put as follows:—

Tea.	Cost of 20 cups.
1*s.* 8 per lb.	1·78 (224 cups to the lb.)
2*s.* 0*d.*, „	1·70 (280 cups to the lb.)
2*s.* 6*d.* „	2·14 „ „

"As to the differences in quality between the fine and the common teas, let people try a test for themselves," says an expert. "Let those who have been satisfied with the lower grade try a pound of the 2*s.* 4*d.* article and then revert to the other: they will never take to that other again. We have found by practice that the fine article will always produce more tea than the common grades."

Scientific data supports the judgment of tea experts in distinguishing fine teas from the common types and in fixing their value and character; and, moreover, it has been scientifically demonstrated that the finer teas supply better value because of what they contain of the actual essentials of tea in good proportions compared with cheaper sorts. The economy of using strong, rich tea rules out the conventional spoonful measurement as applicable to all descriptions; less need be used where there is the advantage in strength and quality and that helps to narrow differences in outlay, which come to the veriest trifle in the weekly domestic budget.

All this points the moral of judicious selection at reasonable prices; and with this is coupled the warning, voiced by experts, that business in teas reduced in quality to face an inequitable selling rate must have in the long run a damaging effect on the public consumption of teas.

Russia as a Customer.

It is on the finer teas that those best qualified to express an opinion base their faith, in looking for a still greater expansion of business, both at home and abroad. The home consumption has grown steadily for the past ten years; and amongst countries which offer scope for enterprise Russia may be mentioned.

Already a large tea consumer, Russia will probably, be a still bigger buyer now that a substitute has to be found for the banned vodka, and any accession of business in that direction may send tea to higher prices.

However, that does not immediately touch the market, in which the indications are in the direction of continued firmness. Nothing new is to be said at the moment as to the prospects of supplies, and the cautious man hesitates at this juncture to point to the outlook concerning coming crops. —*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 19.] MAY 8, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish the Quarterly Proceedings of the Mundakayam Planters' Association. We notice that the resolution proposed by the Chairman that unless the Labour Department disassociated from the U. P. A. the Mundakayam Planters' Association would withdraw from the Parent Association, was withdrawn after a lengthy discussion, after it had been addressed by Mr. Richardson, Chairman of the U. P. A., who pointed out that the liability of District Associations to the U. P. A. was limited to Rs. 100. The Scientific Officer Scheme was discussed at length, but no resolutions were put before the Meeting. We note that there will be another meeting on June 26th, and we repeat our hope that all District Associations will send their Delegates to the Annual Meeting authorised to support the Scientific Officer Scheme, which it is proposed to place before the Madras Government.

In an article we have extracted from the *Daily Telegraph*, closer co-operation between Industry and Science in advocated. Closer co-operation between Science and Agriculture is no less needed. More so in fact as Agriculture touches us all and much more closely than Industry. Without the assistance of continuous Scientific advice and experiments, and the results of those experiments, individual efforts, however good in intention, must be but spasmodic. Science will guide us along the right lines.

The Assistant Chemist has joined his appointment under the Planting Expert and it is hoped that all planters will take advantage of this increase in the staff to send soils and fertilisers for analysis, and we would again draw attention to the Scale of fees charged, and which are printed at the end of this issue.

To the *Scientific American* we are indebted for a very interesting article headed "Autographs," and describing the valuable investigation and instruments of Professor Bose, which go to prove that plants have the same sensations as animals. We regret we are unable to reproduce the illustrations that accompanied the article.

DISTRICT PLANTERS' ASSOCIATIONS.

Mundakayam Planters' Association.

Proceedings of a Quarterly General Meeting of the Mundakayam Planters' Association held at the Mundakayam Club, on Saturday, 17th April, 1915.

PRESENT.—Messrs. J. J. Murphy (Chairman), R. Harley, H. M. E. Howson, F. Simmons, E. E. Eyre, W. Hendry, C. Hendry, R. J. Scarbrough, J. A. Richardson, W. O. Asher, A. Hamond, J. Wedderspoon, D. U. Somers, A. Pollock, T. H. Fitchett, E. Vincent, S. P. Easton and G. West (Honorary Secretary) and by *Proxy*: Messrs. J. R. Vincent, H. B. Kirk, and E. Hall. *Visitor*: Mr. R. Tait.

Minutes.—The Minutes of the last General Meeting were taken as read and adopted.

Sri Mulam and Travancore Combined Planters' Association Delegate's Report.—Mr. Asher, who represented the Associations at the Sri Mulam Popular Assembly and at the annual Meeting of the Travancore Combined Planters' Association, read his report. A vote of thanks to Mr. Asher proposed by Mr. Richardson was unanimously carried.

Labour Rules.—These were gone through in Committee and on resuming the Meeting, several additions and amendments were agreed to. The Honorary Secretary was requested to write to the Central Travancore Planters' Association and ask for a copy of their Rules and also to know if that Association would be willing to consider the question of having inter-District Rules.

Small-pox Epidemic.—The Chairman stated that the members present would doubtless be aware of the serious outbreak of small-pox in Mundakayam and pointed out the effect which this had upon the labour of surrounding Estates. He also reported that he, Mr. Harley, and the Honorary Secretary had had a Meeting with the Sanitary Commissioner from Trivandrum and it was arranged that all necessary steps for the prevention of the spread of the disease would be taken.

After discussion, it was unanimously agreed, on the Chairman's proposal "That Government be asked to sanction a Town Improvement Committee for Mundakayam, the necessary funds being provided by an acreage cess on all Estates except Teekoy and Cheruvally." Mr. Richardson thereupon expressed the view that many of the residents in Mundakayam had no right or title to the sites which they occupied and proposed "That the Government be asked to take steps to remove all infected Kutcha buildings in Mundakayam and to disinfect permanent buildings." This was agreed to. The Honorary Secretary was instructed to write to Mr. Tharyan, the Mundakayam Magistrate, and thank him for his ready and hearty co-operation in dealing with the outbreak.

U. P. A. S. I. Labour Department.—The Chairman proposed "That in the event of the Labour Department not being entirely disassociated from the U. P. A. S. I. the Mundakayam Planters' Association will withdraw from the parent Association" and said:—

"This resolution, Gentlemen, was drafted at our last Meeting after a discussion in Committee. We have no quarrel with the new Department.

So long as it does not interfere unfairly with our labour, it would be unreasonable of us to quarrel with it merely because we do not require its services. But it is quite reasonable to ask that the U. P. A. S. I. should in no way be financially liable for it. Your Honorary Secretary wrote to Bangalore about this point and Mr. Norton replied that Counsel's opinion said the Association is not liable. We asked for a copy of this opinion but so for have not even been favoured with a copy. The salary list of the new Department is a heavy one, and I think we may safely assume that Mr. Martin and his Assistants have very properly secured their positions by definite and binding agreements and that these agreements have been signed by U. P. A. Officials.

A subscriber to the Labour Department has, I believe, to sign a bond or guarantee, and this guarantee must also be in favour of the Association and not of the Department as the latter has no separate legal standing. If I am right, then the Association is responsible for the salaries of the Labour Department's Officials and defaulting subscribers to the latter will have to be prosecuted by the Association and not by the Department.

An objectionable feature of the present arrangement is that the Chairman of the U. P. A. is *ex-officio* one of the members of the L. D. Control Committee and this practically means that a non-subscriber to the new Department, need never aspire to the high honour of being elected Chairman of the U. P. A.

Estates which do not belong to District Associations are allowed to subscribe to the Labour Department. This seems to me a very peculiar thing, and I think, that if the Department remains in the U. P. A., it should be put a stop to.

Resignation from the parent Association should not, however, be decided on without serious consideration. The Association may not have done much good in the past. Of its three great achievements we have no use for two—the Madras Labour Act and the Labour Department, and very little use for the third, the Scientific Officer Scheme, though Mr. Anstead is not to blame for this. But what the future has in store for us none of us know, and so long as our liabilities are confined to the small sum of two annas per acre, I certainly do not advise the 'lonely furrow.' "

The resolution was seconded by Mr. Hamond. After a lengthy discussion in Committee, the Chairman said that as Mr. Richardson had assured them that the Articles and Memorandum of Association of the U. P. A. S. I. strictly limit the liability of District Associations to Rs. 100 each, it was unnecessary for him to press his resolution and with Mr. Hamond's approval he had pleasure in withdrawing it.

Scientific Officer Scheme.—This subject was discussed at length in Committee but no resolutions were put before the meeting.

Roads.—The Honorary Secretary read a letter which he had received from the Chief Secretary to Government intimating that the Government had sanctioned an annual grant of Rs. 625 for the upkeep of the Road from Vellanadi Estate to Mundakayam and also a contribution of Rs. 2,150 towards the cost of the bridge built by the Rani Travancore Rubber Co., across the Boyce River.

The Honorary Secretary was requested to write to Government thanking them for what they had agreed to do and also ask Goverment to deal, as soon as possible, with the question of the Kutikal-Yendayar Road about

which they had been previously written. Mr. Harley suggested that Government be also asked to put in a thorough state of repair that portion of the Mundakayam-Peermade Road extending from the 40th to the 43rd mile, and that the co-operation of the Central Travancore Association be asked in this connection.

Mr. Hamond stated that complaints had been made that the Road metal heaps by the side of the Mundakayam-Kottayam Road were interfering with the Motor Traffic and causing much damage to tyres and the Honorary Secretary was requested to draw the Executive Engineer's attention to this.

Import of Medicines containing opium and alcohol.—As Mr. J. R. Vincent's proxy, Mr. Simmons explained the difficulty which he had experienced in procuring such medicines for Estate use and the Honorary Secretary was asked to find out from Government what steps should be taken to facilitate the import of these drugs.

Association Rules.—A revised set of Rules, which had been previously agreed on in Committee, was submitted to the Meeting and on the proposal of Mr. William Hendry, seconded by Mr. Simmons, was unanimously adopted.

Members of Committee.—Mr. William Hendry, was unanimously appointed a member of Committee in place of Mr. J. R. Vincent, who had resigned.

Cattle Pound.—Certain correspondence with regard to this was laid on the table, and it was explained that nothing has so far been done towards the erection of the building. It was, therefore, agreed that Rs.500 be subscribed on an acreage basis by all Estates except Teekoy and Cheruvally for the cost of the erection of the Pound.

Date of next Meeting.—This was fixed for 26th June next.

A vote of thanks to the Chair was unanimously passed on the motion of Mr. William Hendry.

(Signed) J. J. MURPHY,
Chairman.

(„) GEORGE WEST,
Honoraay Secretary.

GERMANY.

Situation in the Potash Industry.

The "Frankfurter Zeitung" of 3rd March, states that, owing to the war, the German Potash Syndicate has practically lost its export trade, which was its principal source of profit. The business remaining comprises chiefly sales for domestic industries and above all for German agriculture. Sales for the latter promise to increase, because owing to considerable rises in the price of other fertilisers (phosphates, nitrogenous substances, &c.,) farmers are turning to potash manures this spring, so as to ensure the best possible harvest. This increased business may not, however, balance the enhanced cost of production in the works, which has been caused by lack of workmen, smaller production and high prices of necessary raw materials. It is stated that efforts are being made to induce the Federal Council to allow a slight rise in the price fixed by the "Potash Law" for potash for use in domestic agriculture.—*The Board of Trade Journal.*

INDUSTRY AND SCIENCE.

Closer Co-operation.

A Conference of leaders of industry and science was held at the Mansion House, yesterday, for the purpose of discussing the working conditions in which British industry at present operates, and of suggesting a new basis for these conditions. It had been called by the directors of the newly-formed Institute of Industry and Science. In anticipation of the Conference, Mr. J. Taylor Peddie, F.R.S., who is one of its vice-presidents, has just issued a "Study of the First Principles of Production, and the Relation of Science to Industry," and the discussion at yesterday's meeting was opened with an address by Mr. Peddie on the "Influence of Science on Political Economy."

Mr. Frank Warner, president of the Silk Association, who presided, said there was no reason to strike a despondent note. There was nothing radically wrong with our industries, and we had no reason to be less than proud of the achievements of our scientists. Our weakness lay in the fact that the two were not working together to anything like the extent they should do, with the result that industry, without the aid of the chemist, was often handicapped by out-of-date and wasteful processes, and did not produce goods of a merit or of a novelty such as would have resulted had the services of science been called in. Owing to lack of organization much of the valuable work of our scientists had slipped through our fingers and gone abroad, to the permanent enrichment of foreign countries and to the detriment of our own. It behoved us to make the best use of the period of grace which the war gave us to put our business house in order.

Mr. Peddie prefaced his address with a brief account of the Institute of Industry and Science and its objects. In order, he said, that they might be in a position at the end of the war to suggest successfully a new basis for the working conditions of British industry, they must have the co-operation of the leading trade organizations and of leading men in industry and science, as well as the co-operation of those who controlled the finances of the country. A large number of the trade organizations and leading men of industry and science were already members of the institute, and as all the preliminary organising work and literature had now been completed, and at considerable expense, they desired to see the movement expand as rapidly as possible.

Commerce after the War.

After the war competition for international trade would be severe. In consequence of the heavy war costs and indemnities which, we hoped, Germany would have to pay, her wages bill would have to be reduced, possibly to the extent of 15 or 20 per cent., and she would be able to undersell our manufacturers for some considerable time, in the markets of the world. Another great danger was the American position. The United States would probably be a greater commercial competitor of ours than Germany, for the reason that their resources were not prejudiced, but improved, by the war. Their immediate business was to make British industry attractive to British finance, and they could begin this object for themselves without waiting for the Government.

In his address on "Political Economy," Mr. Peddie adversely criticised both the Free Traders and the Protectorists, contending that the theories of Adam Smith and John Stuart Mill, however applicable to the conditions of their times, were now out of date, while those who advocated Protection forgot that science and scientific knowledge were the basis of all production, and that Protection would not in itself be sufficient to increase the productivity and efficiency of industry. The success of Germany could not by

any process of reasoning be attributed to her tariff system, but was due to her system of national economies, which made science the basis of all her industries.

Sir Philip Magnus said they had gathered to formulate some constructive policy to carry out the object which they all had in view; but interesting as was Mr. Peddie's address, he had to own that so far he had not heard in what way they were to improve the conditions which needed improvement. Mr. Peddie had pointed out that we in this country were as industrious and inventive as any of our rivals, and that we had as efficient a band of trained scientific men as any other country. How, then, were we to account for the commercial success which had been achieved by Germany? It was not due to the superiority of German educational institutions, nor to a higher standard in her technical schools, nor to any superiority in the output from German research laboratories. He agreed with Mr. Peddie in assigning it to the superior organisation of the German people. Germany had brought to bear on her industries the output of the scientific researches of her chemists; and we ought to see how that could be done in this country. That was the problem which, he understood, this society was formed to solve.

Position of the Scientist.

It had been said by Professor Huxley that the discoveries of Pasteur sufficed to pay the whole indemnity of the Franco-Prussian War; and he (Sir Philip Magnus) ventured to say that the discoveries of our fellow-citizen, Dr. Perkins, had contributed very largely to supply the German Government with the funds to prosecute their war against this country. We must assign a higher position in our industries to scientific men than we had done in the past, and a better position than the Government assigned to them in the scheme for the increase in our manufacture of dye stuffs. He hoped that the company formed in pursuance of that scheme would be a success; but whatever might be the result of its working, this country ought never again to be so dependent as we had been in the past upon the products of any foreign country for those materials which were essential to our own industries and to the employment of hundreds of thousands of our fellow-citizens.

Colonel Cassel, (president of the Institute of Technologists), strongly condemned the dye scheme, and said it ought to be made a criminal offence now or in the future to give employment to a German in this country in any capacity whatever.

The Earl of Portsmouth moved a resolution declaring that it was desirable that there should be a closer co-operation between industry, science, and finance, and heartily supporting the efforts of the Institute of Industry and Science in this connection.

The Hon. T. Mackenzie, (High Commissioner for New Zealand), seconded the motion, and it was adopted unanimously.—*Daily Telegraph*, March 26th.

BRITISH INDIA.

Estimated Area and Yield of Ground-nuts in 1914-15.

According to the final general memorandum issued by the Department of Statistics, Calcutta, the total area in British India under ground nuts in 1914-15 is returned at 1,995,000 acres, as compared with 2,106,000 acres in 1913-14, a decrease of 5 per cent. The total outturn for the 1914-15 season is estimated at 929,000 tons of nuts in shell, as against 749,000 tons for last season, an increase of 24 per cent.—*The Board of Trade Journal.*

AUTOGRAPHS.

Plant Autographs and What they Mean.

AN INVESTIGATION WHICH PROVED THAT PLANTS HAVE THE SAME SENSATIONS AS ANIMALS.

What is it that distinguishes a plant from an animal? It is response to excitation, pleasant or unpleasant, to all intents. Strike a dog and he will wince with pain. Strike a tree or a bush and it remains imperturbable. To be sure there are "sensitive" plants, like Mimosa, which close their leaves when touched, but no Biologist would dream of pain in that connection. In other words, a plant seems to differ from an animal in a total lack of psychological response to the outer world. Even the automatic action of Mimosa has been attributed to hydromechanical and not to excitatory causes.

These well-established conceptions of plant life have been completely upset by the remarkable experiments conducted for many years by Dr. Jagadis Chunder Bose, a professor of Presidency College, Calcutta. After lecturing in England before the Royal Institution and other scientific bodies, Prof. Bose was sent to the United States by the British Government in order to acquaint American scientists with his work. He has lectured before our leading Universities and scientific societies, with a success that is rare.

Prof. Bose, has succeeded in demonstrating by actual experiment that there is no essential difference between an animal or plant in responding to external stimulus, that the mechanism of response is similar in both, and that there is no barrier whatever between the animal and the plant, such as we have imagined. Like an animal, plant can be drugged, poisoned, exalted, depressed, and fatigued, and like an animal it proves to have nerves which transmit excitation with a measurable velocity.

THE INGENIOUS INSTRUMENTS WITH WHICH PLANTS WRITE.

This astonishing discovery was made with instruments of unprecedented delicacy, instruments which Dr. Bose invented for the very purpose of analysing plant sensations. A graphic record of plant movements, however minute, must be made. Hence, some form of writing lever must be used, which as shown, is connected by means of a very delicate thread with a leaflet. The writer is a thin vertical wire attached to a counterpoised horizontal lever, supported in frictionless jewelled bearings. As the leaf falls under excitation a glass plate is lowered at a uniform rate by clockwork, and upon the smoked surface of this plate the writer will trace a curve, which will be not only a record of the responsive movement, but a record of the time relations involved.

Such an apparatus might have been employed long ago had it not been for its obvious inaccuracy. It must be clear to every one that the friction of the writer upon the smoked glass completely vitiates the accuracy of the record. To make the system trustworthy, Dr. Bose hit upon the ingenuous principle of electro-magnetically tapping the smoked glass plate at regular time intervals, so that a dotted line is obtained instead of a continuous curve. Thus he was able to overcome at once the difficulty of friction.

But the invention of an instrument which would tap instead of trace records was not the easy task that might be supposed. Limitations of space forbid our discussing with the fulness they deserve the problems that confronted Dr. Bose. Eventually he devised the instrument—his "resonant recorder." This instrument is so constructed that the recording point is

given an electrical impulse exactly perpendicular to its recording movement ; the intermittent closures of the electric circuit are properly timed, so that the writing index is not subjected to attraction in the course of its journey ; the electro-magnet employed is cylindrical and therefore without laterality, so that the writing index cannot have a tendency to execute its to-and-fro vibrations in any other direction than that which is perpendicular to the plane of the terminal pole of the magnet. The electrical impulses are timed with the greatest regularity by means of a reed maintained in a state of persistent vibration by the usual electro-magnetic arrangement. This reed interrupter, called a coercer by Dr. Bose, is tuned to the natural frequency of vibration of the recording index, so that the intermittent magnetic pulls will exactly synchronise with the natural swing of the writing index.

The advantage of intermittent over continuous contest in obtaining records is well shown in Fig. 3 representing two successive experiments on the same leaf under identical stimulation. The lower record was taken with continuous contact and the upper with the same recorder, but in a state of vibration, giving intermittent contact and the upper with the same recorder, but in a state of vibration, giving intermittent contact. Stimulus was applied at the point marked by the vertical line,

How Plants are Stimulated.

Dr. Bose classifies stimuli into (1) mechanical (blows or pricks) (2) chemical (acids, alkalies, etc.), (3) thermal (hot wires, etc.) and (4) electrical (inductive shock, condenser discharge, constant current, etc.). Since chemical stimuli cannot be employed to obtain a series of uniform excitations for quantitative investigation, and since blows and pricks may cause mechanical jars which may affect the record, Dr. Bose prefers the thermal and electrical modes of stimulation, and, accordingly, employs the electro-thermic stimulator, the condenser discharge apparatus, and the induction shock apparatus.

When a muscle is excited, there is a brief interval between the incidence of the stimulus and the beginning of the reponsive movement—a lag which is called the " latent period." After the lapse of the latent period, the record-curves increase in amplitude to a maximum. The period required up to this point, Dr. Bose calls the " appex time." With the resonant recorder, Dr. Bose has found that different plants exhibit different characteristics of response. In summer, Mimosa has a latent period of one-tenth of a second ; the maximum fall of the leaf was attained in three seconds ? (apex time), and the recovery was completed in fifteen minutes. The movement of recovery is about three hundred times slower than the excitatory fall, in this instance. Increase the stimulus and the extent of response increases. The stronger the stimulus and the higher the temperature, the greater is the increase in the rate of movement. Fatigue decreases the rate. Winter produces a physiological depression which prolongs the latent period and reduces the amplitude.

All Plants are Sensitive.

Thus tested, all plants prove to be responsive. Hence, the old distinction between " sensitive " and " insensitive " plants is purely arbitrary and scientifically unjustified. Cabbages, peas, beans, and other kitchen vegetables are sensitive, although not so highly excitable as Mimosa. By means of electrical response, moreover, Dr. Bose has shown that every plant and every organ of plant is sensitive and responds to stimulation by a definite electrical charge. An intensity of induction shock which is barely sufficient to induce sensation in man is quite enough to cause excitatory fall in

a Mimosa of moderate sensitiveness. Indeed, Dr. Bose found that a highly excitable specimen can, under certain conditions, be ten times as sensitive as a man!

If, instead of permitting a plant to recover sufficiently after shock, it be stimulated again, a diminution in the height of response indicative of fatigue is noted. In a highly excitable specimen the phenomenon of growing fatigue can be easily recorded; in a subtonic specimen, an equally characteristic effect is obtained—a gradual enhancement or what is known in muscle investigation (with which it is exactly parallel) as a "staircase response." After attaining a maximum excitability under successive stimulation, there generally ensues a fatigue decline. This is to be attributed to the gradual bettering of the tonic condition under successive stimulations. In other words, the accession of stimulus gives rise to two kinds of effects—external and internal.

So sensitive are plants that even the passing of a cloud is not without influence, as Prof. Bose's records conclusively prove. Carry a highly excitable plant into a dark room and its excitability disappears for an hour. Prof. Bose noticed that Mimosa was depressed on rainy days. He was able to trace the cause to the absorption of water. A pair of uniform responses were first taken. A drop of water was then applied at the proper place (the pulvinus) when the leaf was recovering from the second stimulus. It will be noticed that the period of recovery became very much protracted in consequence of absorption of water. The plant was gorged, and like a gorged animal, its sensitivity had been affected. A drop of glycerin abstracted the water and restored excitability.

How Plants suffocate and are Poisoned.

Gases have as marked an effect on plants as on animals. Carbon dioxide is popularly supposed to be good for plants. Prof. Bose shows that it is just as depressing and poisonous to a plant as to an animal. Ozone, as might be expected after this, is stimulating, so much so that a fatigued plant can be refreshed by its means. Alcohol vapour produces first exaltation and then depression, the plant responding in a very human way. Ether likewise depresses, but is not so narcotic as chloroform. Carbon disulphide resembles ether in its effect. Coal gas is moderately depressing. Ammonia abolishes excitability, for as long as two hours, if strong vapour is employed. Sulphureted hydrogen is not only depressing but extremely poisonous in its effect, and since it is found in large quantities in city atmospheres, we can now well understand why it is impossible for some plants to thrive in towns at all. Nitrogen dioxide is fatal, and so is sulphur dioxide.

That plants die like animals we all know; but we do not know the exact moment when they die. For hours a dead plant seems alive. There is no twitch, no death spasm. Dr. Bose has succeeded not only in noting the precise moment when a plant gives up its life, but in recording its death spasm. The plant is heated very gradually so as to avoid all excitation. This is done by placing the plant in a water bath, the temperature of which is continuously raised by the application of a gas or spirit flame. At 60 deg. Cent. a spasmodic extraction takes place, clearly indicated in the record produced in Fig. 15, which is in truth a death curve. All attempts to obtain response, after this sharp inversion of the record, fail, even though the plant is cooled down to its normal temperature. This death temperature of 60 degrees is constant for all plants.

Nerves or Mechanism—Which?

Is there a true excitatory change in the plant? If so, is there any specific contracting tissue, corresponding with the nerve of the animal, for the transmission of excitation? It is known that the excitation of a living animal tissue is attended by a concomitant electrical change of galvanometric negativity. If we make suitable galvanometric connections with two points on a nerve and we stimulate the nerve at a distant point, we shall find that the arrival of excitation from the distant stimulated point is at a proper moment signalised in the galvanometer by a deflection of a definite sign. Prof. Bose has found that the excitatory change of galvanometric negativity is similarly transmitted to a distance through certain plant-organs, thus proving that plants have nerves. By applying stimuli of constant intensity and by allowing proper intervals of rest, Prof. Bose has obtained successive values of the velocity of transmission, which values are constant. The highest velocity of transmission of excitation was found to be 30 millimeters a second in the petiole of Mimosa. The velocity varies with the tonic condition of the plant. Fatigue depresses the rate; high temperature increases it. Excitation is transmitted in both directions; but the velocity is not necessarily the same in the two cases.

Until Dr. Bose made his experiments, it was the accepted theory that in plants like Mimosa there is merely a transmission of hydro-mechanical disturbance and no transmission of true excitation comparable with that of animal nerve. Haberlandt compared the excitatory movement of a Mimosa leaf with the effect produced when an India rubber tube containing water at a given hydrostatic pressure is pinched, with the result that the increase of pressure at any point is transmitted in the form of an undalatory wave. If this is so, transmission should always take place regardless of the physiological conditions. Haberlandt's theory and others like it, must be abandoned. Professor Bose found that excitatory reaction is indicated in the periole of various plants by the discriminative polar action of an electric current; excitation is induced at the kathodic point at "make" and at the anodic point at "break." This transmission occurs in the absence of all mechanical disturbances. The excitatory nature of the impulse is further demonstrated by the arrest of conduction brought about by various physiological blocks. Moreover, local application of increasing cold retards and finally abolishes conductive power. Conductivity is even paralysed for a time as an after-effect of cold, but the conducting power is quickly restored by tetanising electric shocks. Conductivity of a selected portion of the petiole may be abolished by local application of poison such as potassium cyanide. It is quite evident from all this that a plant, like an animal, has nerves.

Plant Tissues that beat like Hearts.

In certain plants we observe what are known as spontaneous movements. *Desmodium gyrans* or the telegraph plant of India is a conspicuous example. The lateral leaflets execute pulsating movements which are not unlike the rhythmic movement of the heart. Prof. Bose has studied this curious phenomenon and finds that it has more than a superficial resemblance to the beating of cardiac tissue.

Because a whole plant cannot be easily manipulated Prof. Bose experiments with the detached petiole. A similar practice is followed by Biologists in studying the action of the animal heart. As in the case of the isolated heart, the movement of the detached leaflet can be renewed by the application of internal hydrostatic pressure. In some experiments a modification of the resonant recorder must be employed—an instrument which

Prof. Bose calls his oscillating recorder, in which the recording plate, by means of an electric motor provided with an eccentric is made to execute a to-and-fro movement. Thus, it becomes possible to use a light grass haulm for the recorder. When the resonant recorder is used the record appears dotted; with the oscillating recorder a dotted record is obtained. Fig.10 shows how very regular are the pulsations obtained with detached petioles; this is a continuous record lasting four hours, the movements themselves being maintained uniform for more than seven hours.

The records obtained show that the rhythmic tissues of the plant are extraordinarily similar to those of the animal. By the application of ligature the pulsation of the heart is arrested; a similiar arrest occurs in the telegraph plant by the proper application of ligature. Cold lowers the frequency of a frog's heart beat; it also lowers the frequency of the telegraph plant's pulsation. Rise of temperature produces an opposite effect in both the animal heart and in the beating leaflet. Alcohol and dilute carbon dioxide prolong the period, while strong applications arrest pulsation altogether. Dilute vapour of ether and carbon disulphide induce a temporary arrest, revival taking place after substitution of fresh air. Copper sulphate and potassium cyanide, both poisons, stop pulsation, potassium cyanide the more quickly of the two.

No satisfactory theory has been offered to explain these "spontaneous" movements. Prof. Bose believes that he has shown that there is no such thing as a spontaneous movement. The energy that makes a heart beat or a leaflet vibrate is derived from external sources directly or from the excess of such energy already accumulated and held latent in the tissue. When the stored supply is exhausted activity ceases, only to be renewed again by fresh stimulation.

With his remarkable instruments Prof. Bose has thus subjected plants to questioning shocks and recorded their answers. His records are in reality autographs which lay bare processes which have been wrapped in the profoundest mystery. The effects of environment, of stimulation, of variations in physiological activity are written down in a script that is as intelligible as the printed word on this page. The plant proves to be more closely allied to the animal than we suspected. Indeed, there is hardly any phenomenon of irritability observed in the animal which is not also found in the plant. Prof. Bose has therefore made not only a notable contribution to plant physiology, but he has widened our whole conception of organic life and has proved that there is but one life, whether it be the protoplasmic scum of a murky pool or man himself.—*Scientific American.*

Rubber in Abyssinia.

In Abyssinia the export of rubber is a Government monopoly vested in the Imperial Ethiopian Rubber Regie. All the rubber now exported is collected by the natives from wild trees, of which there are great forests in the south-west.

There is a plantation of rubber trees on the land of Baro Syndicate, close to Gambela. No report has been received lately on the prospects of these trees, which are still immature.

Special circumstances, aided by the low prices offered in Europe, spoiled the output in 1913; 34 metric tons were exported from Gambela, and 37 metric tons *via* Jibuti. The rubber can be bought and landed in London at a cost of about 1*s.* 2*d.* per lb. With fine hard Para selling at 3*s.* per lb., Abyssinian rubber fetches about 1*s.* 6*d.*—*The India-Rubber Journal.*

SCIENTIFIC DEPARTMENT, U P. A. S. I.

Scale of Fees for analysis in the Bangalore Laboratory.

A.—SOILS.

		Rs.
1.	Complete Chemical Analysis, including the available Potash and Phosphoric Acid	...40
2.	Mechanical Analysis	...10
3.	Complete Chemical and Mechanical Analysis ...	...50
4.	Calcium carbonate and oxide content	...10

B.—FERTILISERS.

1.	Potash in Potassic Fertilisers	8
2.	Phosphoric acid, total and citrate soluble, in Phosphatic Fertilisers	8
3.	Organic Matter, Insoluble Matter, and Nitrogen in Poonacs, &c.	6
4.	Organic Matter, Insoluble Matter, Nitrogen, and Phosphoric acid in Bones, Fish, &c.	8
5.	Complete Analysis of Fertilisers such as Composts, Cattle manures, &c.	...20
6.	Complete Analysis of Lime, Limestones, and Slaked Lime	...10

Half the above rates will be charged to all Members of District Planters' Associations.

For methods of taking samples of Soils and Fertilisers and the quantities to send for analysis see *Planters' Chronicle* Volume X pages 207 and 216.

All samples for analysis should be sent plainly labelled to "The Planting Expert, 25, South Parade, Bangalore," and should be accompanied by a covering letter giving full information about the sample and the analysis desired according to the above table. Fees should be remitted to "The Secretary of the United Planters' Association of South India, 25, South Parade, Bangalore."

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 20.] MAY 15, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

TEA.

The Spraying of Tea.

The Indian Tea Association have recently published a very valuable Bulletin (No. 1 of 1915) written by Messrs. Andrews and Tunstall, Entomologist and Mycologist respectively; dealing with the subject of the spraying of tea for insect and fungoid pests.

A list of the common pests is given with the appropriate treatment for each, while other sections of the Bulletin discuss sprayers, and insecticides and fungicides, giving formulae for these latter.

The Bulletin should be in the hands of all Tea planters in India. It can be obtained from the Secretary of the Indian Tea Association, Calcutta, and costs, we believe, Rs.2. The following extracts are reproduced from this Bulletin :—

General Treatment.

"In the past, few attempts have been made to combat a pest or blight until it assumes an epidemic form. A general treatment for the removal of organisms which interfere with the growth of the tea plant is a desirable addition to the routine on most gardens. Although such treatment would be more particularly useful in dealing with vegetable organisms, it would also affect a number of important animal pests. The enormous losses due to minor blights, each not sufficiently severe by itself to warrant special treatment, have been almost entirely overlooked. The blights which attack young leaves may have received attention on some gardens; but the numbers of blights which are common on the leaves and stems below the plucking level, have in the majority of cases been passed over as causing very little harm. The loss of the older leaves is a natural process —nature's way of removing waste products from the plant—but the premature death and removal of leaves and shoots, even though they be too old for tea manufacture, interferes with the health of the plant and reduces the out-turn. Besides organisms actually parasitic on the plant, there are others whose presence is undesirable. For instance lichens, mosses, and ferns, which may be found on almost any tea bush. They are rarely parasitic themselves; but they encumber the stems, thus restricting the flow of sap; they clog up the stomata, interfering with respiration and trans-

piration; and they also frequently form excellent harbouring places for harmful pests and blights. The good health of the tea plant does not solely depend on its freedom from injurious organisms. The treatment of pests and blights must in all cases be merely supplementary to the other necessary operations of cultivation, manuring, etc. There are, however, many gardens, and their number is increasing rapidly, where the addition of such a general treatment to the routine would be profitable."

"In the cold season the tea plant is resistant to spray fluids of much higher concentration than those which may be safely applied in the rains. Many of the organisms which it is desired to remove are also specially resistant during the former season. As a general rule, therefore, solutions for winter spraying need to be more concentrated than those employed during the rains."

"In most tea districts there are in each year often two rainy periods separated by an interval of dry weather. During the early rains, the pests and blights which have been dormant in the cold weather, renew their activity, and their ravages are in general specially noticeable during the succeeding dry spell. This dry period is the most convenient time for the application of hot-weather spray fluids. Bordeaux emulsion or lime-sulphur solution are suitable. A second application will rarely be found necessary where the previous applications have been carefully made."

Insect Control.

"The aim of every agriculturalist is to obtain the maximum amount and best quality of produce. Insects, by interfering with the natural growth of the various parts of plants, cause losses in crop and often decrease in quality, and those which are harmful must therefore be eliminated if the best results are to be obtained. This fact was recognised by cultivators in very early times, and they commenced to put various obnoxious substances on to their plants, with a view to keeping insects away. Some of these substances were found to be effective, and the practice was continued and extended until, to-day, it is followed by every up-to-date cultivator, and hundreds of men are engaged in the investigation and thousands in the manufacture of materials and machines for the spraying of plants, as a means of combating insect pests. At first the choice of a substance with which to spray was made in a more or less haphazard fashion. It was thought that the substances most obnoxious to man must be most objectionable to insects, and extraordinary mixtures of substances were used. Later, however, people began to study the subject seriously and methodically. They began to notice that all insects did not attack the bush in the same manner, and that different classes of substances had to be used in dealing with different pests, and that one substance could be used on one plant but not on another, or on the same plant at one time of the year, but not at another; that a substance would kill an insect at one stage of its life history, while having no effect on the pest at a later stage, and so on. And so, by degrees, it came to be recognised that the control of insect pests is not simply a question of putting a poison on the plant, but is a scientific problem of some complexity, requiring for its elucidation an extensive knowledge of the life history and habits of insect pests, of the properties of chemical substances, and of the economy of plant life. The study of this problem was, therefore, handed over to specialists, and now takes a place of almost equal importance with the study of soils, manures and other factors of importance in agriculture."

"A consideration of the problem shows that the depredations of insects may conceivably be lessened in one or both of two ways; first, by attacking the insect; second, by rendering the bush unpalatable to it or immune from its attacks. The last method is very seldom practised, as very little is known of the effects of different substances on plants. Control is generally attempted by directly attacking the insects."

"Insect pests may be divided into two classes, those which suck the plant juices and those which eat the plant tissues, and the recognition of this fact was one of the most important steps in the development of rational methods of spraying. An insect which feeds by biting off and swallowing portions of the plant my be killed by putting on to the plant a poison which it will swallow with its food. but when an insect pest feeds by sucking the juices from the interior of the plant tissues such an application of poison is obviously useless, as the poison will not be taken into the stomach. Insects which feed in this way must be treated by means of a substance which will kill the insect when it comes into contact with it. In consequence, insecticides are divided into two great classes, *poison insecticides*, applied to the plant and swallowed by the insect, and *contact insecticides*, applied to the insect and killing it in some way on coming into contact with it externally. We give here, for the sake of clearness, the distinctions between poison and contact insecticides in tabular form:—

Poison Insecticides.	Examples.	*Contact Insecticides.*
Lead Arsenate		Soap solutions.
Lead chromate		Oil emulsions.
Paris green		Alkali washes.
Copper salts.		Rosin washes.
biting insects	Used against	sucking insects.
the plant	Applied to	the insect—only secondarily to the plant, as the insect happens to be on the plant.
May be applied before the insects appear, so as to poison the first-comers and control the attack from the start.		Must be applied when the insect is on the plant. Previous application is of little or no value.

"In addition to these two classes of insecticides, a third class, known as *fumigants*, may be defined. These are substances whose action depends on the suffocating power of a vapour, and are chiefly used in confined spaces, such as greenhouses. granaries, etc. Carbon bisulphide, and naphthalene, for instance, are extensively used for the purpose of protecting grain from the attacks of weevils. Several fumigants have been tried against tea-pests, with small success, but mention will be made later of a substance supplied for use with the "Universal" White Ant Exterminator, which has been found to be of value for destroying white ants in godowns, etc."

"From the foregoing remarks on the differences between *poison* and *contact* insecticides it will be readily seen that before deciding on a spray mixture to be used against an insect pest, the method by which the insect feeds must be taken into account, but this is not the only factor to be considered. Not only does the method according to which

the insect feeds affect the question, but its nature, habits, and life-history in general must be taken into consideration also. Some sucking insects are protected by a hard coat, which is exceedingly resistant to the action of contact insecticides, and it is consequently useless to apply them. This is the case with the tea-seed bug (*Poecilocoris latus*) for which a satisfactory contact insecticide cannot be recommended. Certain scale insects also have hard outer coverings which afford them complete protection. In such cases spray fluids are applied which kill the insects, not directly, but either (*a*), by gumming the scale to the bark, so that the insect is imprisoned, *e.g.*, resin washes, or (*b*), by acting on the outer covering so that it shrivels up, and the insect falls off, *e.g.*, certain alkali washes."

"When a *contact* insecticide is sprayed on to a plant infested by a species ot active sucking insect, although it may be known to kill the insects when applied to them, it will produce a smaller percentage of deaths than an equally effective substance sprayed on to sluggish or sedentary pests, and effective spraying is thus rendered more difficult in the case of active insects than in the case of sluggish ones."

"In the case of some insects, *e.g.*, the tea mosquito (*Helopeltis theivora*) there is no great difference between the appearance and habits of the insect at different stages of its existence, while in other cases, *e.g.*, the looper (*Biston supressaria*) there are three distinct stages, in each of which the insect has a characteristic appearance and behaves in a characteristic manner. In regard to the former group of insects a method of treatment which is successful at one stage will, as a rule, be successful at any other stage, (We except the egg stage. Insect eggs are exceedingly difficult, in most cases impossible, to deal with by means of sprays,) but in the latter group this is not the case, and each agriculturalist must observe carefully the occurrence of the various stages on the particular estate, and apply the remedy accordingly. In the case of a caterpillar pest, for instance, such observations must be made. A pest of this kind may usually be dealt with by means of a poison insecticide, but when it becomes full-grown it changes into a chrysalis, or pupa, in which stage it does not eat, and is therefore not affected by poisons, and in this stage, also, it is protected by a thick case impervious to contact insecticides. The next and last stage is that of the moth or butterfly. In this stage the insect either does not feed, or, if it does, it feeds by sucking the juices of flowers, perhaps of some plant entirely different from that on which the caterpillar is found. It is obvious, then, that in such cases a poison insecticide is of no value except during the caterpillar stage, and that in subsequent stages other methods must be adopted, such as collecting the chrysalides, or attracting the moths by sugaring or by light."

"Spraying methods have often to be modified on account of the nature of the plant attacked, and the purposes for which the plant is grown. A substance which may be sprayed on to one bush with impunity might seriously damage the foliage of another, and remedies which are effective and safe to use on a tree grown for fruit, are often too unsafe to be used on a plant grown for its leaf. This is especially the case with regard to the spraying of tea-bushes, and one would emphasise, at this point, the fact that *all spray substances used against tea pests should be applied to the bushes as soon as possible after they have been plucked, consistent with applying the insecticide at the proper stage in the life history of the insect.*"

Fungus Control.

"Examination of any piece of jungle will show that almost every tree plant in it is suffering from diseases to a greater or less extent. If plants,

growing in the surroundings to which they have been adapting themselves for ages, are yet subject to disease, it is not surprising that the tea plant, removed from its usual environment and growing under unnatural conditions should be affected. The conditions tending to control and limit the attacks of pests and blights which cause disease are in may cases absent in the environment of cultivated plants, and unless artificial control be introduced the diseases may, and often do assume very formidable proportions."

"Many of the diseases of tea are caused by fungi. The attack of a fungus may be likened to that of an invading army, and just as in military operations it is necessary to know something of the character and dispositions of the enemy before making a plan of attack, so it is important that the nature and behaviour of the fungus causing the disease should be known so that the best methods for its control may be formulated. This pamphlet has not been written with the object of discussing in detail the life history of the fungi and other plant parasites which cause disease of tea, but confines itself as far as possible to a discussion of the artificial means of combating pests and blights. The individual fungi will only be discussed sufficiently to render intelligible the descriptions of the machinery used in their control."

"A fungus is a plant. It differs from green plants in that it is unable to feed on substances of simple chemical composition but requires solutions of food material which have been elaborated by other organisms. Green-leaved plants have the faculty of absorbing energy direct from the sun and using it to build up complex food substances out of simpler chemical substances. One of the main functions of fungi on the other hand is to break up these latter into simpler substances which may eventually be used again by the green plant."

"Fungi may be classified according to their method of nutrition as follows:—

1. saprophytes — feeding on dead matter only;
2. facultative parasites — feeding on living or dead organic matter according to circumstances;
3. obligate parasites — feeding on living matter only.

Some parasitic fungi cause disease of animals but most of them attack plants. They may attack plants in two ways:—

1. living outside the host plant, and sending specialised absorbing organs into its tissues, *e.g.*, Mildews, Thread blight:
2. living inside, and feeding on the host plant, except at certain stages of their life history, *e.g.*, Blister blight, Copper blight.

"Fungi are generally propagated by means of spores. The methods by which fungus spores are distributed are very interesting. All manner of devices are employed to ensure their dissemination. Wind, insects, animals, and human begins are among the agencies employed. The spores of a given parasitic fungus usually only infect one or at most a few closely allied species of plants. There are cases, however, where a fungus spends some stages of its life history on one kind of plant and other stages on another totally different one."

"When a fungus spore, alighting on a suitable surface, germinates, it generally sends out a slender tube which either enters itself or sends down smaller tubes into the tissues of the host plant in some cases the fungus can only enter through a wound, in others it forces its way through the unbroken surface of leaf, stalk, or other part of the host."

"After a period the fungus forms spores which are often produced in special receptacles. Most fungi produce more than one kind of spore.

Each kind is as a rule specially suited to a particular set of conditions. For instance in the rainy season a fungus may produce a thin-walled spore capable of germinating at once but unable to withstand drought, while in the autumn the same fungus may produce spores which are specially adapted to resist drought and sunshine, and only germinate after a period of rest. In this manner the propagation of a particular species of fungus is carried safely through from one season to another and from one year to the next."

"Parasitic fungi are common on all plants, but only occasionally do the attacks of an individual species assume an epidemic form. Other causes than the presence of an abnormal number of the spores of the fungus account for epidemics. They are usually brought about by the occurrence of atmospheric conditions exceptionally favourable for the infection of the plant by the fungal spores. Changes in other conditions also play a part. Epidemic attacks of fungus disease have occasionally been traced to the effect of alteration of soil conditions on the natural resistance of the plant. This change in soil conditions may have been brought about for instance by the introduction of badly balanced manurial mixtures or by the gradual reduction in the amount of some necessary soil constituents as the result of soil exhaustion."

"It will be readily understood from the foregoing that knowledge of the life history of the fungus causing a disease is necessary in order that the method of treatment may be so arranged that the attack shall be concentrated on the fungus at a time when it is in the most vulnerable condition, and carried out in such a way that there is some chance of checking the disease effectively. It would be obviously useless for instance to spray a fungus with a contact fungicide during the period at which it is entirely within the tissues of the plant. It would be futile to attempt to eradicate a fungus merely by spraying the tea if the fungus is spending stages of its life on some other plant, possibly one found commonly in the jungle. It would be necessary in such a case either to treat the jungle plant as well as the tea or to remove the jungle plant, and it might be a sheer waste of time to attempt to deal with the disease by treating the tea bushes only."

"There are many problems connected with the study of the life histories of fungi, and those of many of the fungi causing diseases of tea have not yet been solved. In formulating methods of treatment in such cases in the absence of evidence to the contrary it is presumed that the fungi resemble others of allied species and action is taken accordingly."

The Indian Revenues.

The Indian Revenues for the official year, for April, 1914, to March, 1915, contrast thus with the corresponding period of the two previous ones (000 omitted):—

April-March.	1912-13. Rs.	1913-14. Rs	1914-15. Rs.
Land Revenues ...	34,23,11	34,61,39	34,55,29
Salt ...	5,00,16	5,16,79	5.85,41
Stamps ...	7,60,37	7,97,74	7,43,10
Excise ...	12,41,45	13,33,95	13,24,05
Provincial Rates ...	82,82	27,03	6.84
Customs Receipts ...	10,79,59	11,33,73	9,52.75
Assessed Taxes ...	2,46,49	2,77,42	2.89,12
Forest Receipts ...	3,22,95	3,34,48	2,90,31
Major Irrigation ...	3,91,85	4,14,89	4,00,16
The Opium Revenues stand thus:—			
Receipts ...	7,68,69	2,43,73	2,30,55
	89,91	1,51,76	98,15

—*Capital.*

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Green Bug,

The Pollibetta correspondent of the *Madras Mail* writing to that paper on 5th May, has the following note on Green Bug in Coorg :—

"It was at this time last year, that this pest was discovered to be affecting the trees in a severe form throughout nearly the whole District. It was dealt with with blow lamps, and brushing and spraying the affected trees with the mixture recommended by the Scientific Department. Of all the measures adopted for combating the pest, a spraying with a knapsack pump was pronounced to be the most efficacious, as it searched out the bug in all parts of the affected trees, while with burning and brushing much of it was missed. One spraying, however, has not proved effectual and it is necessary to follow it by a second spraying in a fortnight's time. This is difficult if large areas are attacked by the bug, though one filling of a spraying machine is capable of getting over a considerable number of trees. It is to be noted, however, that even where spraying could not be adequately carried out, the pest did not apparently prove harmful to the coffee. The monsoon appears to have wiped out a good deal of it too. If this is so, the grip which the bug is said to have got on the coffee in Ceylon in the past was possibly due to the fact, though the climate there is more humid than it is here, that the rainfall is more equally distributed throughout the year, while in Coorg it consists of heavy precipitations confined to four or five consecutive months. In this, as in other cases it is held by some that the best remedial measure that can be adopted is intensive culture. Much has been done, I hear, to enable the coffee on the Pulneys, which was reported at one time to have suffered severely from the pest, to resist its inroads by a little judicious shading of the coffee, cultivation, and manuring."

I quite agree that the best safeguard against plant diseases generally is good health, careful attention to soil cultivation and manuring, and good pruning, in other words, intensive cultivation, but there are many pests which have the power of attacking healthy vigorous plants and Green Bug is one of them. Last year the climatic conditions favoured the parasitic fungus of the Green Bug with the happy result that the pest had a serious set back. It has, however, not entirely disappeared and this year it is possible that conditions may not be so favourable for the fungus. I would, therefore, once more warn planters not to depend on climate and intensive cultivation alone as methods of controlling this serious pest, but to strengthen these natural aids by persistent spraying, especially in the dry weather when the bug first makes its appearance. Anyone who has visited the Pulney Hills will have been shocked to see what ravages the pest has made among the Coffee there, the abandoned bungalows and estates in charge of writers, all telling a tale of not exactly prosperity, and while it is true that just at present the Bug seems to have largely disappeared, when at its height it did an enormous amount of damage and it may do so again. The Coffee districts of Coorg and Mysore should not run the risk of letting this pest reach a really virulent stage, since the price of future immunity is too heavy to pay. Therefore, I would say once more...spray and keep one on spraying.

The best machine to use for the purpose is undoubtedly a knapsack sprayer of an autospray type which leaves both the cooly's hands free, and the Fish Oil Rosin Soda soap appears to be a fairly cheap and quite efficient insecticide.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Central Travancore Planters' Association.

The first Quarterly General Meeting of this Association was held at Kuduakarnam Bungalow on Saturday, 24th April, 1915.

PRESENT :—Messrs. H. C. Westaway (Chairman), J. A. Richardson, F. Bissett. J. S. Wilkie, F. W. Winterbotham. A. R. St. George, J. M. Wilkie, R. Tait, C. A. Mackenzie, W. A. J. Milner, Mr. W. E. Forbes, (visitor) and R. P. Roissier, (Honorary Secretary).

The Notice calling the Meeting was read.

The Minutes of the last meeting were taken as read and confirmed.

Correspondence.—All correspondence since the previous Meeting was read. The Honorary Secretary was instructed to write to the Sanitary Commissioner informing him that the Estate against which he had made a complaint was not an Estate belonging to this Association. The Honorary Secretary was also instructed to write to the Planting Member asking him if he can give us any information regarding the amount of money being spent by the Indian Tea Association in advertising in Southern India and to ask him to be good enough to keep us informed in this matter.

Gift of Tea to Russian Troops.—All correspondence regarding this Gift of Tea was read and a letter from the Imperial Russian Consul at Colombo was read in which he thanked the Association for this Gift.

It had been agreed that all Estates in the Association should give at the rate of 2 lbs. per acre, the result being that the total amount of 8,384 lbs. was sent. This *via* Colombo and Vladivostok. The Estates with donations are as follows :--

	lbs.
Penshurst	600
Twyford and Vembenard	1,550
Fairfield	800
Maimallay	436
Stagbrook	1,235
Ashley	806
Carady Goody	984
Arnakal	1,313
Haileyburia	660
	8,384 lbs.

The Honorary Secretary was instructed to write to Messrs. Aspinwall & Co., Ltd., Cochin, and to thank them for the assistance given and for having kindly paid all coast expenses and shipped the Gift free.

Election of New Member.—Read letter from Messrs. Peirce, Leslie & Co., Ltd., Cochin, asking to be allowed to become a Member of this Association. It was proposed by Mr. Richardson and seconded by Mr. Wilkie :—"That Messrs. Peirce, Leslie & Co., Ltd., be elected a Member of this Association, as a Firm, at an annual maximum subscription of Rs. 25 and this entitling them to one vote only which can be used on all matters except those dealing with the Taxation of Land." This was carried unanimously.

Sri Mullam Delegate's Report.—Mr. Mackenzie read his report which is as follows:—

Mr. Chairman:—At the request of this Association I attended the Sri Mullam Assembly and will now give you my report.

I thanked Government for what they had done and were about to do to the Peermade-Kottayam Road and also the road from Vandiperiyar to Kumili and pointed out the necessity of the section between Vandiperiyar and Pambanar being repaired in order to draw traffic through Travancore territory that would otherwise cross the frontier at Kumili. The Dewan seemed to think this a strong point, so I think we can hope for the repair of that section in the near future. I also thanked Government for the work that had been sanctioned in connection with the landing stage at Kottayam and I got the Kottayam Member to ask that the work be put in hand at once.

I addressed the Assembly on the subject of Tea Thefts and impressed upon Government the very serious aspects the thefts of tea had and has assumed in this district and the apparent inability of the Local Police to cope with it. I had a most sympathetic hearing from the Dewan who said that there was no doubt that there was room for serious complaint and that he would see what could be done to bring in a Tea Theft Act. The only trouble was that there was no such Act in British India to go upon. I think, Sir, we may rely on Government helping us in this matter and even perhaps giving the Indian Government a lead as they did in the case of the Rubber Act.

My complaint about the Police has, I am glad to say, had great effect already. The Peermade Sub-Inspector has been transferred and in the latest case they have been of the greatest help to us, although it was a non-cognisable offence. The Kottayam Police have by a clever piece of work traced the Tea and arrested the thief and when warrants have been issued will be able to arrest the receivers. When this case is finished, I think the Association ought to bring to the notice of Government the services rendered by the two Inspectors at Kottayam. I should like to place on record the excellent reception I had from all the Executive Officers of the Government of Travancore.

In closing allow me to thank you for the honour you have done me by appointing me to be your Delegate at the Sri Mullam Assembly. (Applause).

The Chairman thanked Mr. Mackenzie for his interesting report and for having represented this Association at Trivandrum.

Tea Thefts.—This was discussed and suggestions recorded.

Scientific Department, U. P. A. S. I.—Mr. Richardson addressing the Meeting said:—

Gentlemen,—As you are aware, the development of the Scientific Department of the U. P. A. S. I. has been before us for some time, and at the last meeting in Bangalore, certain proposals were put forward and a very generous offer made by the Madras Government.

I need not go into full details of the Scheme, as you have, no doubt, all read the book of proceedings of that meeting.

The nett result, however, was that the U. P. A. was asked to put up Rs.15,000 a year against an estimated expenditure of some Rs.35,000

annually, the Madras Government to take over the control of the Department and provide us with a Mycologist and an experimental station.

A committee was appointed to go into the matter but unfortunately this terrible war broke out and the whole scheme had to be shelved for the time being.

Early in the year, however, we again approached the Government with the result that a meeting of the Scientific Committee was held in Madras on the 24th of March last which was attended by Mr. Chadwick, the Director of Agriculture, and Mr. Anstead.

The whole matter was carefully gone into and some important alterations proposed to the original Scheme, which, I think, will greatly add to the utility of the Department.

The most important of these was the matter of the experimental station. It was realised that it was quite impossible to find a place suitable for the growth of all our products, taking into consideration the varying elevation and climatic condition required for tea, coffee and Rubber and apart from this, if a new experimental station was started and the different products had to be planted, it would take some four to five years before some of them would reach the stage for experimental work.

With a view to meet this difficulty, it was proposed to establish six experimental stations of 20 acres each in selected areas asking Proprietors to hand over to the Department the above acreage of tea, coffee and rubber for a term of say 15 years free of charge.

The produce of the station would be handed back to the Estate it was situated on at a cost equivalent to what it cost the Estate to produce and the Department paying all working costs.

The cost of these Stations was gone into and the initial cost of starting them with quarters for the native assistant in charge, cooly lines, tools, etc., worked out about Rs,2,500 each or Rs.15,000 for the six stations plus Bungalow and Laboratory for the Mycologist Rs.10,500 or roughly Rs.25,000 initial expenditure.

The annual up-keep of these stations including Mr. Anstead, his Laboratory and the Mycologist would be just on Rs.45,000.

The proposed stations were as follows:—

Tea	...	...	Peermade and Wynaad.
Rubber	...	...	Malabar and South Travancore.
Coffee	...	...	Mysore—Coorg and Shevaroys.

The Mycologist would probably be stationed in Peermade as he would have a rubber district within 12 miles of him but of course, would tour round all the districts.

Each Station would be in charge of a native Superintendent who had taken his degree in the Coimbatore College. One point on which I insisted was, that the stations should provide their own labour and not be dependent on the Estates in any way and this was allowed for.

After our meeting the Hon'ble Mr. Barber and myself accompanied by Mr. Chadwick had an interview with the Hon'ble Mr. A. G. Cardew, and put proposals before him. We had a most sympathetic hearing and he promised

to see what could be done but, of course, the scheme was a much bigger one than previously proposed and it was a question of money which on account of the war was a difficulty and it might be necessary to curtail the number of stations to four or five, and this is a possibility we must be prepared for.

Now, Gentlemen, I think you must agree that if this scheme goes through, it will be of immense value to the planting industry and one which deserves the support of all, and I hope it may be the means of bringing in present non-members to our different district Associations.

It will tax the resources of the U.P.A. to the utmost to find the necessary funds and it is up to planters throughout Southern India to see that this opportunity is not lost.

The U. P. A. is not asking for any increased subscription as district Associations have already had heavy calls to meet for the Labour Department, but this is a time for combination, and the prospect of an efficient Scientific Department, which is badly needed, should appeal to those who have held aloof so far.

Another addition we have made to the Department is the appointment of a native assistant to Mr. Anstead to enable him to undertake soil and fertiliser analyses, notes about which were published in a recent *Chronicle*.

Labour Department U. P. A. S. I.—Mr. Roissier asked for permission to be allowed to ask a question regarding the Labour Department. This was granted. Mr. Roissier said that he had read that one or two Associations in S. India had expressed their opinion that the Labour Department should be kept apart from the U. P. A. S. I. and one Association had gone so far as to say they would resign from U. P. A. S. I. unless this was so. No reasons had been given and he, the speaker, would like to know if any Member could give any information on this subject and knew of any reasons for this move ?

Mr. Richardson replied as follows —

Gentlemen,—There has been a great deal written and said about the Labour Department lately and the Mundakayam Association went as far as threatening to secede from the U. P. A. unless it was altogether disassociated from the U. P. A., but I am glad to say the resolution was withdrawn.

Rumours have got about that the Labour Department was being financed by the U. P. A. S. I. and those members who do not make use of the Department feared that they might be held responsible for any failure or financial loss incurred by that Department.

I wish to make it quite clear that the Labour Department is in no way indebted to the U. P. A. and in fact at the beginning of the last quarter carried forward a credit balance of Rs.60,000 unexpended.

Another point that must be remembered is that the liability of the members of the U. P. A. (that is each District Association) is limited to Rs.100 each, so that it is not a very heavy responsibility should the whole concern go bankrupt.

What some people seem to forget is that the Labour Department is the outcome of years of work of the U. P. A.

We started with a Registration Scheme which was voted too cumbersome and the present Department took form from the resolution passed at

the U. P. A. meeting of 1913 which read as follows :—"That this Association accepts the recommendation of the Labour Committee to establish a Labour Commission of its own." which was carried unanimously.

This was followed by an extraordinary general meeting of the Association in March 1914, the recommendations of which were confirmed at the last U. P. A. meeting and certain alterations made regarding the constitution of the Control Committee to meet objections that had been brought forward. Under these circumstances, I cannot see any reason in the argument that the Labour Department should be separated and have nothing to do with the parent Association.

If there are still any objections to the constitution of the Control Committee, these are matters for discussion at the next Bangalore meeting where I am sure they will have every attention.

Mr. Roissier :—Thank you.

The Chairman thanked Mr. Mackenzie for his hospitality in giving the use of his Bungalow for the Meeting.

With a vote of thanks to the Chair the Meeting terminated.

(Signed) REGINALD P. ROISSIER,
Honorary Secretary.

Coffee.

A rising Brazilian exchange for a time led to higher quotations on the terminal market, but very little has been done there, the speculative element having been, for the present, entirely eliminated. Towards the end of the week the exchange again gave way, and quotations were inclined to be easier, but there is still a strong demand and large shipments are again reported both from London and direct from Brazil on cost and freight terms. Much of this is believed to be for consumption in Russia, where there are indications that Coffee is becoming more popular, and the prohibition of vodka is turning the population to some other kind of stimulant. There is also a good demand from the home trade, and quotations in many cases are dearer. For the time of year only a moderate quantity of either Costa Rica or East India has been offered, and the former is 1*s.* to 2*s.* dearer, while for the latter the high opening prices have been maintained. Colombia continues to arrive in much larger quantities than usual, but the Continental demand is sufficient to take all that comes.

London Coffee Returns.

	*Home Consumption.		Export.		Stock.	
	1915 Tons.	1914. Tons.	1915 Tons.	1914. Tons.	1915 Tons.	1915. Tons.
For week ended March 20 ...	480	356	659	513	16,287	18,464
For 11 weeks ended March 20 ...	4,735	3,346	5,661	4,495	—	—

*The Home amount contains a proportion for Export delivered by cart.—*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 21.] MAY 22, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department publishes an article on "Lime Burning on Estates," giving an interesting note sent by a well-known planter for publication. The difference in price between Estate burnt lime and imported lime is noteworthy. Included in the article is a letter on "Potash" addressed to to the Editor and the Planting Expert's comments on it.

From the Scientific Department's Quarterly Journal published by the *Indian Tea Association*, we print an article on "Root Nodules" which will be found very interesting, and incidentally will remove some misconceptions as to the functions of Nodules.

With War being carried on in Persia, we have thought it would interest our readers to know something of the Trade which is carried on between India and ports on the Gulf, so we give an extract from the *Journal of the Royal Society of Arts*. It will be noticed that there has been a very large decrease in the exports of Tea between 1908 and 1914. The trade of the Bahrein Islands in 1913-1914 was 72 per cent. of the imports, an increase of 11 per cent. over 1912-13, mostly in the hands of Hindu. Indian Mahommedan and Persian merchants. 12,668 cwts. of coffee was imported.

The Consular Report on the Agricultural Products of Nicaragua is published showing the exports of coffee to various countries.

The India Rubber Journal furnishes us with the overseas trade in March in Rubber. A large increase will be noticed between 1913 and 1915.

We are obliged to the Chairman of the Mundakayam Planters' Association for his letter which is gratifying as it removes a misapprehension that might have existed in the minds of his hearers or readers of the report. But how many will read the amende ?

Mr. Anstead, the Planting Expert, is leaving for Kotagiri this evening to spend the Whitsuntide Holidays.

The Director of the Labour Department has returned from his tour in Coorg, and next week, accompanied by a Photographer, intends to visit the Anamalais with a cinema, for advertising purposes.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Lime Burning on the Estate.

The following interesting note on this subject has been kindly forwarded to me by a well-known planter for publication :—

"Recently needing some 50 tons of lime for application to clearings, it become necessary to determine whether to burn it on the estate or to purchase it as slaked lime. Having always heard that burning one's own shells was the cheaper way of obtaining slaked lime this method was decided on. In the past I had burnt many odd kilns of lime but had never had, what I considered really satisfactory results. As the lime I am now applying will probably be a recurring expenditure on some part of the estate, I thought it worth while to secure the services of a professional lime burner to instruct a few coolies into the mysteries of reducing shells to slaked lime."

"A series of kilns were built the inside measurements of which were 3' 6" diameter at base by 3' high, the walls having an outward slope of 4." At the base of the walls, which were built of well puddled mud, seven 3" draft holes were made. These holes remained full open the whole time the kiln was burning. Over each kiln a rough grass roof was erected to protect the kilns from rain. Each kiln dealt with 27 kerosene tins of shells and needed 51 cubic feet of closely stacked firewood which was cut and split into pieces about the size of a man's fore arm. The lime burner insisted on all firewood being split up in this manner. Commencing to fill the kiln, firewood was closely packed layer on layer to a height of 10", a small space being left in the centre about 8" or 10" square, into which fire was introduced and was then well capped down with wood. A course of shells 4" deep was then put into the kiln and on the top of this another 8" course of tightly packed firewood. Courses of shell and firewood were then introduced, the top course one of shell and standing some 8" or 6" above the walls of the kiln. After the kiln had been burning some 12 to 15 hours some 8" or 9" of firewood was put into the kiln and on top of this some 5 tins of shells. This was allowed to burn for a short time until the wood had well caught fire when more firewood was put into the kiln and on it another 5 tins of shells, and as soon as this had burnt down, a further course of firewood some 8" deep was placed on top of kiln. Over this wood leaves were sprinkled and 2 kerosene tins of already slaked lime were then spread on top of the leaves and well damped down, the idea being to form a crust and keep heat in the kiln. This completed the actual charging of the kiln. The burnt shell could only be taken from the kiln on the 5th day when the following figures were results noted."

"To charge kiln the following quantities had been used :—

27 kerosene tins of shells, each averaging 46 lbs. —1,242 lbs.

51 cubic feet of firewood.

2 tins slaked lime.

"*Out turn.*—27 tins of burnt lime and ash after deducting two tins for slaked lime introduced.

Notes,—(1) 27 tins of burnt shell after slaking gave 46 tins slaked lime.

(2) 1 tin shells weighs 46 lbs.

(3) 1 tin burnt lime weighs 30 ..

(4) 1 tin slaked lime weighs 30 ..

(5) Before charging each kiln the inner and outer face of wall was cowdunged to prevent cracks.

(6) Kiln walls were well staked round on outer side and lashed with cane.

(7) The deduction of two tins from out-turn of kiln was made in weight of slaked lime @ 30 lbs. per tin."

"After burning some 27 tons of shells, the following is found be the cost of lime burnt on estate as against cost of bringing up same in a ready slaked state from coast.

Cost per ton of burned lime on estate including coast of kilns and roofing same.

		Rs.	A.	P.
Labour on estate including firewood	...	4	10	0
Purchase of shells at coast	...	2	0	0
Transport to estate	...	11	14	6
Total cost per ton	...	18	8	6
Slaked lime purchased and transported from Coast per ton	...	23	0	0
Balance in favour of estate burning	...	4	7	6

or deducting the item of transport in both cases, in the former Rs.11-14-6 and the latter Rs.13-4-0 the figures are Rs.6-10-0 against Rs.9-12-0."

The use of Potash.

A Correspondent writes to the Editor of the *Chronicle* as follows :—

"Mr. John Hughes, the well-known Agricultural Chemist of London, writes in the *Indian Planters Gazette* as follows :—"This war is teaching English Farmers to do without Potash Salts in the various compounds applied to Hops, Potatoes, and even Mangolds which, as you will note from my article in "The Field" of 24th October, removes more Potash in an average crop than any other Farm rotation, *viz.*, 262 lbs. per acre for a yield of 22 tons. Tea Planters, therefore, need not fear that the omission of Potash from the local manures will cause any serious decrease in the yearly yield of Tea. The fact is, that the sale of Potash Salts has been systematically pushed by a powerful German Syndicate, which was supported by the German Government, so that expense was not spared, but fortunately we can do without these German Salts." "

"If Coffee also can thrive without Potash it would be a great saving to Planters, and it would be interesting to know what the Planting Expert has to say to this.

"I find also that Mr. Hall in his work on Fertilizers states, that Soda and Potash exchange places in the soil, and that if Soda in some form is applied, such as Nitrate of Soda, the Soda becomes insoluble while the dormant Potash is rendered available.

"Potash Salts in India are so very expensive that any substitute for it would be a great boon to the Planting Community." Ignoramus. Coonoor, 10th May, 1915."

With regard to the use of Potash for crops like Tea and Coffee, two things must be borne in mind, first, that no plant can grow without Potash, which is one of the essential elements of plant life, so that if the amount of Potash naturally stored in the soil in an available form falls below a certain minimum, the crop will suffer; secondly, that in some soils there may be

such a small amount of Potash in any form whatever that, even if replaced by Soda, enough is not set free for the requirements of the crop.

Soils rich in Potash, or which have been regularly fertilzed with Potash salts over a long series of years, may quite possibly be able to withstand the withdrawal of this item from the annual application of manures for some time, at any rate until the War is over, but to give up the application of Potash altogether, and for all time, would in many cases be a fatal mistake. It is surprising how Coffee and Tea will respond in many cases to an occasional application of Potash Salts, especially when these have not been used for some time.

No hard and fast rules can be laid down for the use of Potash, or any other fertiliser, which will apply to all crops and all estates. If a soil analysis shows a marked lack of available Potash it will be found a sound policy to apply this fertiliser, if, however, there is a large store of available Potash, it need not be applied. One certainly should not use Potash, and nothing but Potash, year after year, or any other manure for that matter, but Potash and all manures should be applied in rotations and on a systematic plan, based on a soil analysis in the first place, and results obtained in the second.

With regard to the statement quoted from Hall, what he actually says is—

"As a manure, Nitrate of Soda is of course treated as a source of Nitrogen. It is not sufficiently realised how valuable the Soda base may be. This is not because Soda is in any way necessary to the nutrition of the plant, but because of the action of any soluble salt upon the insoluble Potash compounds in the soil. The potash of the soil is due to the partial weathering of double silicates like felspar into clay which is not regarded as pure Kaolinite, but as containing a certain proportion of Zeolitic bodies intermediate between felspar and Kaolinite, hydrated double silicates containing potash, soda, magnesia, and lime combined with alumina and silica. Any soluble salt, and particularly a soluble soda salt, will react with these zeolites and exchange bases to an extent depending upon the relative masses of the two bodies; hence, nitrate of soda acts on the clay in the soil and brings a little potash into solution. To such an extent does this action take place that in practice a dressing of nitrate of soda on any but the slightest soils will dispense with the necessity of a specific potash manuring even for potash loving crops."

Again, when discussing the results of some manurial experiments with Mangolds at Rothamsted he says:—

"Both in this series of plots and that in which the mangolds receive, no dung the value of potassic manures is small where nitrate of soda is the source of nitrogen. This is not only because the sodium can be made to do *some* of the work usually done by potassium in the plant, but also because it is able to attack the compounds of potash in the soil (*the Rothamsted soil contains an enormous reserve of insoluble potash*) and bring it into solution so that it becomes available for the plant." (Italics are mine.)

Before deciding to give up using Potash or replacing it with nitrate of soda on Tea and Coffee estates, one should make sure that the soil contains reserves of Potash which can be set free by the soda. This is by no means always the case.

RUDOLPH D. ANSTEAD.
Planting Expert.

ROOT NODULES.

It is well known that the nodules produced on the roots of leguminous plants are connected with their power of obtaining free nitrogen from the atmosphere and rendering it available for the use of plants. There is, however, some confusion as to the nature of these nodules and the following brief description may be useful to planters interested in green manuring.

The nodules are caused by bacteria which enter the young roots from the soil. The bacteria which occur in different species of leguminous plants present slight differences in form, and it has been found by experiment that the bacteria-forming nodules on one host plant frequently fail to infect another plant of a different species. It would appear, therefore, that the species or at any rate the variety of bacteria causing root nodules differs with the host plant. Some legumes when introduced to a new district fail to produce nodules although they may be found on them in abundance in places where they are indigenous. The introduction of soil from the district where the plant usually produces nodules or of cultures of the variety of bacteria found in the nodules, to the soil of the new district, is followed by the normal production of root nodules.

Nodule bacteria have been frequently grown in cultures on gelatine and in solutions, and in that condition they fix nitrogen only feebly, if at all. They can indeed exist without free nitrogen so that although a large number of these bacteria may be present it does not necessarily follow that a great deal of nitrogen is being fixed.

The bacteria are only present in the nodules on the roots and if they are introduced to other parts of the plant they merely die. It is by no means certain that the nitrogen assimilation takes place in the nodules. It seems probable that the fixation is rendered possible by the interaction of the bacteria with the host plant. Chemical substances, formed by the bacteria, and introduced from the nodules into the plant, may render possible the assimilation of free nitrogen by the host plant itself.

However, and wherever the assimilation of nitrogen takes place, it is certain that the nitrogen fixed is not stored in the nodules, but is used by the plant in the formation of nitrogenous substances necessary to its own development. It is not merely fixed and stored for the use of other plants. The error is commonly committed of supposing that the death of the nodules renders available the nitrogen fixed by the agency of the nodules bacteria. This is entirely wrong. The nitrogen fixed is only rendered available by the death and decay of the tissues of the plant, of which it forms part. The maximum benefit from a green manure crop is only obtained on the death and complete decay of the plants. The idea that most of the nitrogen is in the roots because the nodules are borne on them, is erroneous.

A comparison of separate analyses of various parts of leguminous plants shows that with the exception of the seed the highest percentage of nitrogen is found in the leaves. The following figures, taken from analyses of Boga medeloa (*Tephrosia candida*) published in the last number of this journal, serve to illustrate this point:—

	Percentage of nitrogen calculated on dry matter.
Leaves	3.85%
Stems	·79%
Roots	·79%

The leaves and stems usually contain a greater weight of substance than the roots, so that the percentage, in the roots of the total nitrogen of the whole plant, is small.

In this case the total weight of the plant was made up as follows:—

Leaves	35·72%
Stems	57·14%
Roots	7·14%

Calculated from these figures, the leaves, stems and roots contribute the following amounts respectively to the total nitrogen of the plant:—

Leaves	73·26%
Stems	24·06%
Roots (including root nodules) ...	1·68%

It will be seen at once that the nitrogen is not stored in the roots. Hence the idea that the nitrogen fixed by leguminous trees such as sau (*Albizzias*) is rendered available by the cutting of the roots in cultivation, is wrong.

The conditions under which root nodules are formed are as follows:—First of all the right kind of bacteria must be present in the soil. Scarcity of available nitrogen in the soil, provided a sufficiency of other necessary constituents be present, favours the growth of these bacteria and the development of root nodules. Leguminous plants growing on soils already rich in available nitrogen fix little nitrogen and the production of root nodules is noticeably restricted. If the host plant be starved in respect of other necessary soil constituents, or injured by disease or other agency, the nodules are reduced in number and size. The growth of root nodules is dependant on the good health of the host plant.—*The Indian Tea Association. Scientific Department Quarterly Journal.*

Sisal Planting in East Africa.

It seems that British East Africa will soon be in a position to supply a good deal of fibre to the world's markets. In a recent number of the *Agricultural News* attention was directed to late experiments in planting sisal in Jamaica. From an article in the *Journal of the Royal Society of Arts*, for August 14, 1914, it would appear that the planting of sisal (*Agave sisalana*) in certain upland districts of British East Africa in rich volcanic soil, which was begun in 1907, is now an assured success. Planting is steadily progressing, and a large increase of production may be looked for, as the conditions of soil, climate, and labour are favourable, enabling the planters to produce sisal fibre at a low cost. On the coast-line, on coral limestone soil, the industry is also being extended, though the yield of fibre per acre there seems to be rather less than on the upland plantations. The article referred to considers that the industry must soon become most important in East Africa. The suitable climate, the fertile soil, the cheap labour and the low price of land combine to allow of the output of first-class fibre at a low enough cost to ensure a good profit at the average selling price of the last ten years (£33 per ton). As the planters of sisal in East Africa appear also to be using the best decorticating machinery, and baling presses for the preparation of their product, their future success would seem to be assured *The Agricultural News.*

TRADE.

Trade between India and the Persian Gulf.

At the present time, when interest centres on the Persian Gulf and the activities of our troops there, it may be of interest to our readers to know something of the trade which is normally carried between India and ports on the Gulf.

The following description of the places of importance on the Gulf is given in the *Journal of the Royal Society of Arts LXIII.3250.* "At the south-eastern extremity of the Gulf we have Muscat, which, though not actually British territory, is now more completely within our control and restricted from scattering broadcast its former exports of guns and ammunition. Northwards along the Arabian coast we have the Bahrein Islands, over whose trade we keep watch and act as maritime police, while still further to the north-west lies Koweit, the small independent State under our protectorate whose harbour is the best in the Gulf. Proceeding up the Shatt-ul-Arab, we eventually arrive at Basra, which, with Kurnah, is in our own actual possession and marks our headship of authority, whence proclamations and orders will now issue. It is interesting to recall that Basra actually belonged to the East India Company as far back as the eighteenth century. On the Persian side the more important signs of British settlements in evidence are Mohammerah and the Anglo-Persian oil works while further south are Bushire, Lingah, and finally Bunder Abbas at the extreme south.

The total imports into Bushire from India during 1913-14 amounted to a value of £265,436, being 32·14 per cent. of the whole imports and showed an increase of £46,598 and 12 per cent. over 1912-13. The exports to India consisting chiefly of grain, nuts, and spices, amounted to £99,464 during 1913-14 being 16·53 per cent. of the whole exports and showed a decrease of £22,975 or 3 per cent. as compared with 1912-13.

In 1914, out of a total of 135,053 packages of merchandise from India landed at Bushire, 5,672 were tea, but the imports of tea from India have fallen from 758 tons in 1907-08 to 57 tons in 1913-14. This is due to an unscientific tariff and the Acting Vice-Consul, Mr. C. J. Edmonds, says in his Consular Report (No. 5430 Annual Series):—"Black Indian Tea is taxed 6 krans per batman (equal at the most moderate estimate to 33 per cent, *ad valorem*) and suffers most severely. The use of tea is spreading rapidly year by year, yet the amount legitimately imported tends to grow smaller and smaller. It is notorious that tea is sold in the bazaars at a price below the cost price of the legitimately imported article. The tea is first taken to ports on the Arab coast, where a duty of 5 per cent. *ad valorem* is charged, and then smuggled across in native craft. Thus, while less than one ton of tea was legitimately exported to Persia from Bahrein during 1913-14, it is estimated that a quantity no less than 350 tons left that port alone and was smuggled across during the year. Were the duty reduced to even 10 per cent., there can be little doubt that most of the smuggled tea would enter Persia through the Customs, for, if smuggled, the tea must in any case pay the 5 per cent in the Arab ports, and the possibility of saving another 5 per cent only would hardly compensate the smuggler for the risk and extra expense involved in the operation. The Customs revenues would thus stand to gain rather than to lose by a considerable reduction in the scale of duty."

The trade of the Bahrein Islands in the Persian Gulf is to a great extent in the hands of Hindu, Indian Mohammedan and Persian merchants, who have settled there for a century, and thus by far the greater portion of the trade is with India. In 1913-14, 72 per cent. of the imports were from

India, an increase of 11 per cent. over 1912-13. During 1913-14, there were imported from India 12,668 cwts. of Coffee, 17,100 cwts. of Coir, 2,391 cwts. of Cotton, 70 tons of Sugar, and 6,844 cwts. of Tea. In 1913-14, sixty tons of Tea were imported from India to Bunder Abbas.

Agricultural Products from Nicaragua.

In his *Consular Report* (*No. 5127 Annual Series*) on Nicaragua, Mr. Consul R. C. Michell, says :—

"Coffee is by far the most important article exported. The greater part was shipped to Havre, and a small quantity to the United Kingdom. The Nicaraguan coffee is of good quality, and in point of flavour is a standard higher than the Santos, the best grades coming from the Matagalpa and Jinotega districts: these are reputed to be on a level with the best coffee obtainable and are eagerly sought after. The last crop, that of 1913-14, was much reduced in quantity owing to the bad season. The introduction of more scientific methods, and especially the use of phosphates and other manures, have been proved by some of the more enterprising of the Coffee planters to make a great difference in the volume and quality of the crop, and other planters will in course of time benefit by the knowledge derived from these experiments. The coffee harvest lasts from December to March."

"Rubber is mostly of the wild kind collected in the forests. The planting of trees has not advanced beyond the experimental stage, and so far, no great success has been achieved, perhaps owing to the fact that the climatic conditions are not the most suitable."

The following exports of coffee from Nicaragua are given for 1913 :—

(1 kilogramme=2·02 lbs. 100 kilogrammes=1·968 cwts.)

	Cleaned Coffee.	Shell Coffee.	Black Coffee.
To United States ...	833,134 kilos.	464,837 kilos.	392,671 kilos.
To Germany ...	2,476,689 ,,	629,108 ,,	373,371 ,,
To United Kingdom ...	985,825 ,,	524,035 ,,	1,450 ,,
To France ...	4,994,116 ,,	59,728 ,,	184,719 ,,
To Other countries ...	251,391 ,,	241,451 ,,	80,373 ,,

The following are the exports of Rubber during 1913 :—

To United States	212,907 kilos.
To Germany	2,937 ,,
To United Kingdom ...	202 ,,
To Other Countries ...	5,386 ,,

Tea.

Indian Tea.—The quantity offered at public auction was again on a reduced scale, and only 47,000 packages were catalogued. Although the demand was good, yet in some cases an easier tone was noticeable, with irregularity in prices. From the buyer's point of view it is satisfactory to find that the recent rapid advance in quotations has to an extent been checked, but 10½*d.* was still practically the lowest price for sound Pekoe Souchong. The demand continues strong for Pekoe Fannings and good liquoring Brokens, and prices remain firm. Only about 38,000 packages are printed for next week, all of which will be offered on Monday. No further auctions will take place untill after Easter.—*The Produce Market's Review.*

RUBBER.

Overseas Trade in March.

RUBBER BY QUANTITY.

Imports of Rubber*		1913.	1914.	1915.
From Dutch East Indies†	(Centals of 100 lbs.),	N. S.	N. S.	5,628
,, French West Africa	,, ...	5,023	1,572	1,483
,, Gold Coast	,, ...	1,660	1,312	454
,, Other Countries in Africa†	,, ...	N. S.	N. S.	4,292
,, Peru	,, ...	273	2,086	5,137
,, Brazil	,, ...	47,254	41,791	42,705
,, British India†	,, ...	N. S.	N. S.	3,266
,, Straits Settlements and Dependencies including Labuan	,, ...	26,410	43,360	81,096
,, Federated Malay States	,, ...	20,072	24,290	27,958
,, Ceylon and Dependencies	,, ...	11,547	15,946	45,631
,, Other Countries†	,, ...	27,225	32,348	6,292
Total Imports	,, ...	139,464	162,705	223,942

Re-Exports of Rubber*		1913.	1914.	1915.
To Russia	(Centals of 100 lbs.)...	10,929	13,567	12,642
,, Germany	,, ...	25,190	17,038	—
,, Belgium	,, ...	3,692	4,028	—
,, France	,, ...	8,487	13,517	10,277
,, United States of America	,, ...	25,333	68,283	110,756
,, Other Countries	,, ...	7,667	8,197	17,013
Total Re-Exports	,, ...	81,298	124,630	150,688

* Prior to 1915 these figures include waste and reclaimed rubber as well as raw rubber.

† Prior to 1915 imports from the Dutch East Indies, British India, and "Other Countries in Africa" were included opposite the rubric "Other Countries."—*The India-Rubber Journal.*

CORRESPONDENCE.

Mundakayam Planters' Association.

Pambadampara,
Udamapalayam, 16-5-15.

THE EDITOR.
Planters' Chronicle.

Sir,—At the last meeting of the above Association I said with reference to the Labour Department that our Honorary Secretary had written to Bangalore for a copy of Counsel's opinion but had not even been favoured with a reply (not "copy" as incorrectly put in the Minutes). I have now heard that the delay in receipt of a reply was owing to the U. P. A. Secretary having been absent on leave when our Honorary Secretary's letter reached Bangalore so Mr. Norton was in no way to blame and I regret if what I said has caused anyone to think him negligent in his duties.

Yours faithfully,
J. J. MURPHY,
Chairman.

TEA.

Tea Market.

AN EVENTFUL SEASON—FEATURES OF THE OUTLOOK.

London, 25th March, 1915.

Messrs. Geo. White and Co. have just issued their annual report on Indian, Ceylon and Java tea, which, as usual, contains much interesting information and statistical matter. In the course of their remarks on the market for tea the firm says:—"After an eventful season and a period of great anxiety during the early days of the war, when all seemed so uncertain, producers may well congratulate themselves, on being concerned in an article of consumption which owing to a variety of factors arising more or less from the war, has been enjoying a period of great and abnormal prosperity. As an index of the advance in values, it may be noted that soon after hostilities broke out, the price of fair common Pekoe Souchong touched 7*d.* and it has since steadily risen until 10¾*d.* is the current quotation. As has ever been the experience when tea "for price" has, owing to inadequate supplies, been forced up to an abnormal height, gardens which produce large crops of a common to medium standard have the more largely benefited, but as many of the Assam concerns may now be included in this category, the highly profitable results accruing from the advance in market values up to, say, 11*d.* per lb. have been participated in all districts to a much greater extent than could have been the case some years back. As has been the record for several successive seasons, the crop from Northern India has shown a substantial increase, while Ceylon has also progressed each year since 1910.

LARGE CONSUMPTION—INADEQUATE SUPPLY.

"Notwithstanding an increase in the crop both in India and Ceylon, supplies have proved inadequate, and the closing prices of the season for all tea up to, say, 11*d.* per lb. are the highest recorded since tea has become an article of world-wide consumption. While the high range of prices has has not so far apparently checked consumption, it must be remembered that a variety of unusual factors have been at work, foremost among them being the free supply of tea to an enormously increased army, which consumes more per head and with more waste than would be the case under normal conditions; other factors are uncertainty with regard to freight being available to bring home tea in the ordinary course from the producing countries and the fear in some quarters as to a further enhancement in duty has also not been without its effect. Further ahead there is the probability of Russian requirements being greatly stimulated owing to the suppression of vodka drinking. With all these disturbing possibilities against him, the buyer has a most difficult position to face, and the efforts of the trade to acquire some stock in view of eventualities are seen in the prices being realised to-day. These are all more or less bull points, and encouraging to contemplate from the growers' point of view. It must not be forgotten, however, that the unexpected often happens, and the extreme prices now ruling constitute a degree of uncertainty not devoid of danger as to the future welfare of the trade. China, with cheap silver and consequent low exchange, is in a very favourable position, and may once again appear as a competitor, more especially in the supplying of foreign markets. British-grown tea has nothing to fear from the low-class product of China, were quality the determining factor, but high prices for the former as a rule mean the freer use of the lowest qualities, a fact eventually inimical both to the grower and consumer.

Coarse Plucking Temptation.

"In view of the world's probable requirements, it is to be hoped, that conditions will be favourable in India and Ceylon to the production of large crops without recourse being made to unduly coarse plucking, to which present prices will offer a great temptation. Stalk in particular is to be avoided, as tea in which this is a prominent feature, is of the least possible use either for home consumption or export.

"Further advances have been made and welcomed in the direction of turning our invoices with larger breaks and containing fewer duplicates. Under the conditions which have for some time obtained with values forced up from the bottom causing but little distinction between the different qualities, the question of curtailing assortments has arisen. While keeping each grade distinct and avoiding duplicates, we think it of advantage to continue making a reasonable assortment, as it must be remembered, that although the various grades frequently sell at similar prices, they are taken by buyers for different outlets, and any undue curtailment of grades would tend to narrow competition.

"Writing at a time of such a crisis in our country's history, when conditions are entirely abnormal, it would be presumption on our part to attempt to forecast the future; suffice it to say, that perhaps, never was it so pregnant with great possibilities to the grower; time alone can tell how far they may be realised."—*Financial Times. Indian Planters' Gazette.*

China.

Reduction of Export Duty on Tea.

With reference to the notice at page 367 of the *Board of Trade Journal* for 5th November last, respecting the reduction of the Chinese export duty on tea from 1·250 tael to 1 tael per picul, the Board of Trade are now in receipt, through the Foreign Office, a copy of a despatch on the subject from H. M. Minister at Peking.

Sir J. Jordan reports that the export duty on tea, black and green, shipped abroad from China, which had been levied at the rate of 1·250 Haikwan tael per picul since July 1902, was reduced to 1 Haikwan tael per picul as from the 1st November, 1914. Tea shipped from one treaty port to another is still charged at the old rate of 1·250 Haikwan tael. Should such tea subsequently be shipped abroad, the difference over-paid (*i.e.* 0·250 Haikwan tael per picul) is refunded by the original port of export.

The new rate is applicable to the land frontier as well as to the sea-borne trade. Thus, on tea exported across the Yunnan Kwangsi and Manchurian land frontiers duty is levied at the rate of 1 Haikwan tael per picul less the Treaty reduction applicable in each case.

This reduction applies to tea only; not to tea-dust, to tea-log of the Pai-Liang Ching-chien variety, nor to tablet tea, on which export duty continued to be charged at the rate of 1·250 Haikwan tael per picul.

The allowance of 20 per cent. is still granted in respect of unfired tea leaf, and duty is thus charged thereon at the rate of 0·800 Haikwan tael per picul.

(The average value of the Haikwan tael during the quarter ending September 30th, 1914, was 2*s*. 7½*d*.; 1 picul = 133⅓ lbs. avoirdupois).—*The Board of Trade Journal.*

Tea.

Commenting on the German tea trade, Messrs. McMeekin and Co. maintain that the average consumption of tea in Germany over the last ten years has been about 8,360,000 lb., but in 1913 the figure had grown to 9,300,000 lbs. This indicates an increase merely in proportion to the increasing population. The Indian and Ceylon Associations have spent very large sums for many years in trying to convert Germany into a nation of tea drinkers with an altogether negative result, but it has been alleged that she has been consuming quantities since hostilities began far in excess of any previous records. This is rather a curious and unlooked for development of the war, especially in view of the known efforts to prevent any consumption with the German Empire of tea produced in the Indian and Ceylon dependencies of her chief enemies.

Larger offerings have been catalogued in London, report Messrs. W. J. and H. Thompson, but the demand has been equal to the supply and the trade absorbed the quantity, without any material alteration in the level of value. Between 8¼*d.* and 9¼*d.* per lb. the market has been active, competition being to some extent probably assisted by the Government requirements, and teas coming within this range are firmer; lowest grades, however, are, if anything, a trifle easier, more quotations of 8*d.* per lb. being recorded. Above 9½*d.* per lb. prices are irregular, and Broken Pekoes between 10*d.* and 1*s.* per lb. are the cheapest grades now selling. The average for the whole sale for Garden Account at the beginning of December was 9*d.* per lb. for Indian kinds against the same price (9*d.*) a year ago, and 9⅞*d.* per lb. for Ceylons, against 9¼*d.* at the corresponding sales in 1913 —*Tropical Life.*

Coffee.

At the auction of Thursday there was no great accumulation of stocks; in fact, for the time of year the supplies are hardly sufficient to meet the demand. It will be seen by the figures given below that the deliveries this year for home and export together have increased 3,562 tons. and as the landings are 2,135 tons less it is evident that the stock has been rapidly reduced. At this time of year the stock generally increases owing to the arrivals, but with short crops and the difficulty of obtaining freights there is likely to be a shortage for some time. Costa Rica and most of the Central American crops are admittedly very small. As a rule, the shipments are hurried forward and are all received by June, but this year some will probably be much later. Prices have advanced rapidly, and are 3*s.* to 4*s.* above the opening rates. The second size particularly is dearer and there is hardly any Costa Rica to be bought under 80*s.* per cwt. There has also been a slight advance in East Indian and Colombian, but Santos is inclined to be lower for the distant months, although parcels on the spot are rather dearer

London Coffee Returns.

	*Home Consumption.		Export.		Stock.	
	1915 Tons.	1914. Tons.	1915 Tons.	1914. Tons.	1915 Tons.	1914. Tons.
For week ended April 3...	565	348	1,049	641	16,384	19,430
For 13 weeks ended April 3 ...	5,839	4,074	7,569	5,772	—	—

—*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 24.] JUNE 12, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Labour Department is now supported by 98,128 acres of the 100,000 acres originally aimed at. Only 1,872 acres remain to make up the sum total. It would give the Secretary very great pleasure before the end of the financial year, which is the 30th, to announce that the full acreage had been subscribed. It is just possible that new land has been opened and cultivated and that the members have inadvertently forgotten to send the enhanced acreage in.

The Planting Expert writes on "Indian and Colonial groundnuts, their exportation, value and uses." He also comments on an extract from the *Rhode Island Agricultural Station Bulletin* on "Sodium and Potassium as plants foods" and sounds a note of warning to coffee planters. We believe sprayers of all description are at present difficult to produce, and with continual new acres being attacked by Green Bug, the note will be of value.

The Annual Proceedings of the Coorg Planters' Association are printed, and no doubt many of the subjects mentioned, which are of universal interest, will come up for discussion at the Annual Meeting of the United Planters' Association in August.

We publish an important paper from the *Agricultural Bulletin* in the cause of variability of Plantation Rubber.

From the *India Rubber Journal* we extract an article by J. M. A. Wynaendts Van Resandt on the "Valuation of Plantation Rubber." The article only emphasizes the fact how necessary it is that Rubber should be standardized, but if the efforts of the Rubber Growers' Association are well supported, as they should be, the solution should soon be proved.

The London Tea Returns for the week ending March 27th, gives the duty paid in the years 1914 and 1915 and the export for the same years. The year 1915 shows a large increase over that of 1914.

We publish as interesting article from the *Monthly Bulletin of Agricultural Intelligence and Plant Diseases* entitled "The Evaporation of water from the soil" by Keen, B.A.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Indian and Colonial Ground-nuts.

United Empire, the Journal of the Royal Colonial Institute, for May says that under the auspices of the Imperial Institute energetic efforts are being made to create a market in the United Kingdom for the ground-nuts grown in India and West Africa. The export of ground-nuts from India, Gambia, and Nigeria combined amounted to over seven million hundredweights in 1912, of the value of nearly £4,000,000, and hitherto France and Germany have between them absorbed the greater part of this supply. On the outbreak of war the cessation of trade with Germany and the great diminution of the French demand placed Indian producers in a very serious position, and although recently the mills at Marseilles have placed some orders with India, the demand from France remains below the normal. A certain quantity of the nuts have recently been imported into Hull from India for the production of ground-nut oil, which is suitable for use as an edible oil as well as for soap making. The residual cake is a good fodder for cattle, but being a new product to the English farmer a great deal of work is necessary to persuade him to give it a trial.

Sodium and Potassium as Plant Foods.

With reference to what was written in these notes a short time ago with regard to the possibility of Sodium replacing Potassium as a plant food in fertilisers, the following results of an experiment, published in the *Rhode Island Agricultural Station Bulletin*, are of interest. The experiment was begun in 1894 to ascertain the effect of different relative quantities of Sodium and Potassium applied to root crops as chloride and carbonate. Liberal amounts of Nitrogen and Phosphoric acid were used and Lime was also applied. The full amounts of Sodium and Potassium applied per acre were; Sodium chloride, 250 lbs; Sodium carbonate, 220 lbs; Potassium chloride, 420 lbs; Potassium carbonate, 330 lbs.; in later years about one-third of these amounts were used. Increase of Sodium manures raised the amount of Phosphorus but not Nitrogen in the crop. In most cases substitution of Sodium for Potassium caused a decrease in the crop. With Beetroot a 25% increase in yield resulted on adding Sodium manures, but the percentage of total sugar in the crop was lowered. With Potatoes substitution of Sodium for Potassium decreased their growth without altering the percentage of starch, although the Nitrogen was increased. It will be seen from these results that it is not at all safe to substitute Sodium for Potassium without knowing first of all what is going to happen, and the possibility of doing without Potash in Coffee manures is small and certainly needs experimental trial over a number of seasons before it could be recommended.

Sprayers.

A limted stock of pressure sprayers of the 'Holder' type are at present available. Should any planter wish to obtain one of these the Planting Expert will be glad to put him in touch with the suppliers, and quote prices etc. With the gradual spread of Green Bug in Coffee districts, planters should see that they are properly equipped with sprayers and insecticides in order that they may be in a position to tackle the pest directly it appears.

Wants.

The Planting Expert would be glad of knew of any one who can supply Tea Fluff and receive quotations of price for the same. Also if any one has 2-3 cwt of *Saxirubra* bark for sale it could be disposed of.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Coorg Planters' Association.

Annual General Meeting held in the North Coorg Club, June 4th, 1915.

PRESENT.—Messrs. G. K. Martin, E. L. Mahon, G. R. Pearse, P. M. Wilkins, H. M. Mann, A. H. Jackson, F. Hannyngton, I. C. S., (Commissioner of Coorg), M. Brown (Executive Engineer), Talbot Cox, H. C. Wood, H. W. Sheldrick, E. M. Breithaupt, F. Macrae, A. J. Wright, W. M. Ball, C. G. Maclean, T. Hext, F. H. Sprott, C. Elsee, J. W. Irwin, C. Watson (visitor), P. G. Tipping, Honorary Secretary.

The President Mr. J. A. Graham having recently gone to the War, Mr. G. K. Martin was voted to the Chair.

The Honorary Secretary read summons convening the Meeting. Minutes of last Regular General Meeting read and confirmed.

Result of ballot for Office bearers during 1915-16 :—

President... ... ... Mr. W. M. Ball.

Honorary Secretary ... Mr. P. G. Tipping (declined).
Mr. W. M. Ball („)

Committee—North Coorg.—Messrs. G. R. Pearse, G. K. Martin, J. W. Irwin, H. M. Mann, C. G. Maclean (T. Cox, C. Elsee, H. C. Wood, declined).

South Coorg.—Messrs. H. C. Grant, F. W. Gerrard, J. Hume, A. H. Jackson, F. Macrae, W. A. F. Bracken.

The Annual Report was then read.

ANNUAL REPORT (SEASON 1914-15.)

Mr. Chairman and Gentlemen,—The following is a brief summary of matters of interest to our Association that have been dealt with during the past season.

Membership.—At the end of last season we had 66 members. It is with deep regret that I have to record the loss, by death, of 2 members. Amongst those who have joined the Army, from the Province, 7 are members of this Association, I mention this as it has bearing on our subscription list.

Accounts.—Subscriptions, 58, less Rs.5 are shown in the accounts. Of these 4 plus Rs.5 were paid in advance and passed through last season's accounts, 3 of those that were in arrears for 1913-14 have been paid leaving 1 for that season and 7 for 1914-15 in arrears. As these subscriptions stand against the names of members, either deceased or at the front, I have the Committee's sanction to ask that they may be written off. Copies of the accounts are laid on the table, and I shall be glad to give any further information desired.

Scientific Department.—The taking over of the U.P.A.S.I. Scientific Department, by the Government of Madras, has owing to the war, hung fire

and the appointment of an Assistant Officer, being dependent on both these factors, has also hung fire.

Roads & Railways.—Of our standing grievance, the condition of the Coorg-Tellicherry road, I have received no recent complaints or information. As you are aware strong representations were made both by ourselves and by the Malabar Chamber of Commerce, to the Collector and later to the Governor. Repairs were undertaken, perhaps those who have travelled on the road recently will give us some idea of the present state of repair. Within the Province some progress has been made on Local Fund roads. One or two small bridges on the Sidapur-Pollibetta road are under construction. The causeway across the Chickle hole on the Sidapur-Suntikoppa road has after several years delay, been started, but it appears doubtful if any of these undertakings will be completed before the rains set in. Complaints were made of the disrepair of parts of the Gonicopal-Kutta road, but I have heard nothing further recently.

Railway.—This ancient project has, thanks to the energy and interest of our Chief Commissioner, Sir Hugh Daly and our Commissioner Mr. Hannyngton, taken new life and hope, during this season, and as you are all aware the Province has again voted a Cess up to one anna on the Rupee ot the land Revenue to guarantee the interest on the Capital required for the construction of the Coorg portion of the Frazerpet-Sidapur branch of the proposed Yedtore line *via* Hampapur. Our most hearty thanks are due to Sir Hugh Daly and Mr. Hannyngton for the interest and trouble they have taken in this matter.

Pests: Green Bug.—So far as I have been able to ascertain from personal observations and enquiries, the S. W. Monsoon put a very heavy check on this pest, there was a slight recurrence in September and October, this received another check and much of it died out without, apparently being affected by fungus. In addition to this many people have been using "fish oil mixture" and other sprays with good results. In the matter of this very effective "Fish oil mixture" our best thanks are due to Dr. Coleman, Director of Agriculture, Mysore, for taking much trouble and enabling us to obtain a cheap, easy and effective spray. Bug of every description were unusually numerous last year.

Bees and Coffee Pollination.—The result of correspondence with the Forest Department is that Mr. Tireman, our Forest Officer, has consented to withdraw honey and wax from the list of minor products for sale in the Dubarri Forest and includes the Sidapur Bridge over the Cauvery in the prohibited area.

The bees under this Bridge are a public danger, and steps should be taken to prevent their hiving there.

Labour Department.—This is now an accomplished fact, and though the development of the Department has been somewhat hindered by the war, a lot of good work has already been done, and we trust that the Department will continue to develop and flourish, and be a lasting benefit to the whole of Southern India. Your Sub-Committee have drawn up a few rules based on the draft rules issued by the Department. These rules have been circulated and await your confirmation.

This has been a busy season for the C. P. A. The War, Labour Department, Railway Project, Green Bug and other lesser matters entailing a very large amount of correspondence. Our Association might be very

useful to us and its usefulness greatly extended, provided sufficient time could be devoted to developing its usefulness; unfortunately the average Honorary Secretary has not this time to spare.

District Board.—Messrs. W. M. Ball and A. H. Jackson have been duly elected to represent our interests on the District Board, for the next regular period of 3 years, *viz.*, till end of March, 1918.

I would now ask you to pass the accounts and in tendering my resignation wish to record my thanks for and appreciation of the ready assistance I have received from the President whilst he was here and other members of the Committee when appealed to.

(Signed) PERCY G. TIPPING,
Honorary Secretary.

Accounts.—The suggestion that arrears in subscriptions should be written off, as the only outstandings were against the names of members who had gone to the War or deceased was then regularly proposed and seconded by Messrs. Martin and Maclean and carried. Mr. A. H. Jackson, asked if the Travelling allowance voted for Delegate to the U. P. A. S. I. Conference was to be charged to the "S. O. & Emergency Fund" in the future. On this point nothing was decided and no motion was put to the meeting. Mr. Jackson then proposed and Mr. Pearse seconded that the accounts be passed.—Carried.

Roads and Railways.—The Honorary Secretary informed the meeting that the Executive Engineer had just drawn his attention to the fact that the annual upkeep allowance for roads in the Province had been reduced from Rs.400 to Rs.300 per mile, owing to the War, and would doubtless be still further reduced if the War continued indefinitely. Mr. Martin drew attention to the shocking state of the road near Kodupet. The Honorary Secretary informed the meeting that it had taken exactly one year to elicit a reply from the Government of Mysore to his letter pointing out the neglected state of the Road between Mysore city and Coorg, but it was gratifying to know that a good deal had been done in the way of repairs during the year. Mr. Ball speaking of the Coorg-Tellicherry road, said that with the exception of a portion of the road beyond Irruty, which was still in a very bad state, the rest of the road through Malabar had been considerably improved and pointed out the urgent need of a Telegraph station at or near Irruty. The Commissioner of Coorg, intimated that he was trying to induce the Post and Telegraph Departments to establish a Telegraph Office, at Markoot at the foot of the Ghat on the Coorg frontier about 7 miles from Irruty. The following proposition was then put to the meeting: Proposed and seconded by Messrs. Ball and Maclean respectively:—

"That the Virarajendrapet-Tellicherry road being our main outlet to the Coast and no means of communication existing between these 2 places, a distances of 52½ miles, a Telegraph Station be opened at Irruty, which is about half way."—Carried.

Mr. Elsee, pointed out the need of a Telegraph Station at the foot of the Mangalore Ghat but this was not put to the meeting.

Railways.—Mr. Hannyngton, asked if the Honorary Secretary had any further information on the subject of the branch railway into Coorg, *via* Frazerpet. The Honorary Secretary had none.

Mr. Hannyngton, mentioned another more recent project favoured by Sir Harold Stuart being from Marmagoa *via* Wynaad and Kutta into Coorg.

The Meeting was of opinion that Coorg should stick to the original project, on which it had already voted a cess.

Mr. Martin, said that whilst in Bangalore he had heard that the preliminary survey for the Railway from Mysore to the Coorg frontier had been sanctioned.

Labour Department.—The draft rules as drawn up by the Sub-Committee were then read and a general discussion followed. Mr. Ball seconded by Mr. Jackson proposed "That the Sub-Committee be thanked for their trouble and that the rules be passed."—Carried.

Messrs. Mann, A. J. Wright, Tipping and others spoke of the benefits they had already derived from the Labour Department.

Honorary Secretaryship.—Mr. Tipping, asked the Meeting what was to be done about carrying on the work of the Association pointing out that Messrs. Jackson and Mann's suggestion that he be asked to carry on with the assistance of a good clerk, was inadmissible, owing to the lack of funds to meet any such additional expense. Finally, it was arranged that Mr. Tipping should carry on the work of the Association till the next Committee meeting. Mr. Ball, seconded by Mr. A. J. Wright, proposed a hearty vote of thanks to the late Honorary Secretary for his past year's services.

A hearty vote of thanks to the Chair terminated the proceedings.

(Signed) P. G. TIPPING,
Honorary Secretary.
Pro. tem.

Coffee.

Further very heavy deliveries have taken place for home consumption, no doubt largely due to the expectation of an increased duty. After the Budget, which is announced for next Tuesday, the market will have an opportunity of settling down to a normal course without any outside influence to affect it. The stopping of shipments to Holland has materially checked the export demand, and it has been much more difficult to do business. At the auctions, except for home trade sorts, there was very little bidding, and a good deal of the quantity offered was withdrawn. The Indian crop is still coming very slowly; the first shipment of Naidoobatum may be expected next week, but some descriptions indicate that the crop is coming to an end already. A large supply has been received from East and Central Africa, and it may be confidently expected that these districts will send increasing quantities for some years. Much of it is very strong useful Coffee, and grocers would do well to blend it with some of the more acid growths.

London Coffee Returns.

	*Home Consumption.		Export.		Stock.	
	1915 Tons.	1914. Tons.	1915 Tons.	1914. Tons.	1915 Tons.	1914. Tons.
For week ended Apr. 23	646	286	920	475	16,032	23,270
For 17 weeks ended April 24	7,491	4,934	10,414	7,414	—	—

*The Home amount contains a proportion for Export delivered by cart—*The Produce Markets' Review.*

PLANTATION PARA.

Cause of Variability.

AN IMPORTANT F. M. S. PAPER.

The February issue of the "Agricultural Bulletin" contains a very important paper on "Vulcanisation Experiments on Plantation Para Rubber" (the cause of variability) by Messrs. B. J. Eaton and J. Grantham, Department of Agriculture.

"During the last two or three years," they write, "much has been written and many statements made concerning variation in plantation Para rubber. The opinions expressed generally by manufacturers are to the effect that variation is considerable even in the case of "First latex" rubbers when compared with Fine Hard Para at the highest or first grade of wild Para rubber. On the other hand leading rubber technologists and chemists have maintained that the best grades of plantation Para rubber, especially sheet—are superior to Fine Hard Para. Both opinions may be taken as correct, as we shall show, and are not necessarily contradictory. Unfortunately neither the statements made by manufacturers nor the published results of experiments carried out by rubber chemists have indicated the nature of this variation; still less have any published results enabled us to attribute this variation to any definite cause.

"It has been assumed generally that variation refers to differences in the mechanical properties of the raw or vulcanised rubber *i.e.*, strength, elasticity, etc. In our experience this is only true to a limited extent among 'First latex' rubbers and represents only a part and by no means the principal part of such variation, as our experiments will show. Our experiments have so far been confined almost entirely to 'First latex' rubbers—but results obtained from a few samples of lower grades appear to indicate that among these there is in addition a much larger variation in mechanical properties.

"The experiments described in this paper give the first results obtaining in the experimental vulcanising and testing laboratory at the Agricultural Department, apart from tests carried out on a number of estate samples which, at this early stage, have little value from a research point of view except that they show that considerable variation occurs amongst estate rubbers from first latex. Many other experiments have been commenced and are partly completed. The results will be published from time to time in the "Agricultural Bulletin" and will be collected later and published in the form of a special bulletin, when it will be possible to give greater detail and to illustrate the results by means of curves and diagrams which are much more instructive even than the figures given here, since the curves indicate the behaviour of the rubber throughout a test from the initial stretch to breaking point. These experimental results are the first, as far as the writers are aware, which have indicated the most important variation in plantation Para rubber, namely, its variable vulcanising capacity."

SUMMARY OF RESULTS.

(1) Considerable variation occurs in plantation Para Rubbers even in the case of "First latex" rubbers, both from rubbers from the same estates and from different estates.

(2.) This variation is connected principally with the behaviour of the rubber on vulcanisation, *i.e.*, its rate of cure, and not in respect to its strength, elasticity and general mechanical properties, especially in the case of properly prepared "first latex" samples.

(3.) If the rate of cure be known or ascertained under specific conditions, vulcanised rubber, having similar mechanical properties, can be made from all good samples of "First Latex" rubbers.

(4) A difference in mechanical properties does exist, even among so-called first quality rubbers, but these differences are greater between high and low grade plantation rubbers; some rubbers never attain the maximum mechanical properties reached by others, whatever period of cure is adopted. These differences in the case of "First latex" rubbers, however, are not so important to the manufacturer as the differences in rate of cure, and are not of the same order.

(5) The rate of cure is due to the presence of some non-caoutchouc substance in the latex, possibly the proteins or some other constituent, or to some degradation product derived from these substances which acts as a catalyst and accelerates the rate of cure.

(6) This substance may be already present in the latex, and its amount in the raw rubber determined by the mode of preparation and coagulation, or it may be subsequently formed in the latex by decomposition, and taken up by the rubber in variable quantity according to mode of preparation, or alternatively it may be formed in the coagulum in variable quantity depending on the amount of serum (or moisture) left in the coagulum, or the presence of preservatives which hinder or prevent its formation. The alternative theories await investigation.

(7) Smoking, removal of excess of serum (or moisture) in the washing and machining processes and preservatives are among the artificial factors which either hinder the formation of this substance or, if it already exists in the prepared rubber, partially destroy it. The natural difference in latex due to natural cause, may also have a similar effect.

(8) The catalytic substance is probably not affected greatly by heat, since in the processes of mixing and vulcanisation the rubber is subjected to considerable temperatures, although heat may prevent its formation in the latex or freshly coagulated rubber.

(9) The rate of cure of a rubber under specified conditions is not indicated in any way by the apparent mechanical or any other apparent properties of the raw material; hence the absurdity of the present "methods" of valuation of rubber.

(10) *Ceteris paribus*, a manufacturer probably prefers a rapidly curing rubber as it represents economy in heat, labouring and time costs, and secondly, a rubber which cures rapidly is said to have better keeping qualities after vulcanisation. Rapidly curing samples should, therefore, obtain a premium in the market and probably would do, if valuation were carried out on a scientific basis, provided unformity in rate of cure is maintained at the same time.

(11) Uniformity between "First latex" rubbers from different estates will probably be very difficult of attainment with present methods owing to the number of factors involved, but should not be difficult of solution among such rubbers from the same estate.

(12) Two alternatives are suggested: (1) the issue of certificates giving correct rate of cure and mechanical properties at this cure: (2) the attainment of more uniformity by the method suggested in this paper and elsewhere, in which rubber from latex collected during a series of days forms part of one ball or block, which may be described as the method of averages.

RUBBER.

The Valuation of Plantation Rubber.

By J. M. A. Wynaendts Van Resandt.

The subject with which it is proposed to deal in this article is that of the market valuation of plantation rubber, and the question will be raised as to whether planters now obtain for rubber sold its actual value.

Many planters find matter for astonishment in the fact of widely differing prices being fetched in the market by different lots of rubber from the same estate. The reason frequently given for these divergences is an apparently trifling difference in colour or the fact that of one lot not being so "nicely ribbed" as another.

The writer received the other day a letter stating that the rubber from a certain estate, *although considered as being of standard f. a. q.*, fetched 2*d.* less than top price, the only reason being that the sheets were *not ribbed.* This shows quite plainly that plantation rubber is given a valuation largely on its appearance. This position is surely absurd.

A solution of this question would be the standardisation of all plantation rubber. Notwithstanding all the trouble and the efforts of some prominent men, the standardisation of plantation rubber is still far from solved. It is obviously possible to make a standard product on each estate, but it is more difficult to make the same standard quality on all estates. This would only be possible if everyone worked with the same machinery, used the same method of manufacture, the same smoking material, etc. So long as the conditions on the various estates are so different, it will be almost impossible to produce a standard product. I cannot think that companies would be willing to change their factories and machinery just to be able to make the same quality of rubber as their neighbours. If we had found the secret of making rubber as uniform as hard Para rubber at a minimum cost price, we could do away with our present machines, replace them by more simple ones, and the standardisation of plantation rubber would be accomplished. In such circumstances the appearance of the rubber would be the same, and it would therefore be difficult for buyers to maintain price differences according to appearance. Although many kinds of rubber come very near to hard Para in appearance, the right method of preparation has not yet been found, and I am afraid that until this has been attined our rubber will fetch a higher or lower price according to appearance.

Central Rubber Station Formed in Java.

At the Batavia Rubber Exhibition and Congress, Mr. Foll, assistant to Professor Van Itterson, proved clearly how little the appearance of rubber can be correlated to its interior qualities. He told us that he had asked several estate managers to send him ssmples of their rubber and mark these samples in accordance with their higher or lower market value. It happened in several cases after these samples were vulcanised and tested that No. 1, which got the best price, was of less value to manufacturers than say No. 6, which obtained a poor price. This showed clearly the empiric and false basis on which the rubber was valued.

At the close of the Congress Dr. Lovink, the Director of Agriculture in the Netherlands East Indies, asked some directors of estates, visiting agents and leading planters to be present at a meeting, he proposed to hold. At this meeting, at which the writer was present, he proposed the establishment

of a central rubber station. This station would be provided with complete testing installations and would have the following objects in view :—

(1) To guide the planters as to the method of preparation to follow, after having tested their rubber.

(2) To give a certificate of the quality of the rubber which is sent to the rubber market.

This, I think, is a most important matter, and it is to be hoped that in this way some influence will be exercised on the brokers and buyers of rubber in Europe. I know that in the Straits, F. M. S,, and Ceylon there are testing stations of a kind, but I doubt if they are used for this purpose. I would, therefore, ask all rubber planters and those interested in plantation rubber to join the Java planters in their efforts to do away with the empiric valuation of their rubber. This can be reached by standardisation, and a step in the right direction would be made by establishing central rubber stations (all working upon the same lines), and sending a certificate showing the qualities after testing of an average sample of each consignment. The directors of rubber companies at home can do a great deal to help us. It frequently happens that the directors accept forward contracts for crepe as well as for smoke sheet. In this way it is already impossible for the manager to make only one kind of rubber. If only block rubber, similar as being made on Lanadron Estate were made, it would be difficult to do any "hand testing."

Dr. Lovink, our Director of Agriculture, has taken the initiative in the establishment of a central rubber station, on the lines as above explained. What countries and planters will join us and help to put an end to the fancies and caprices inseparable from the present system?—*The India-Rubber Journal.*

Coffee.

The export demand has continued, and, with only small amounts arriving, the London stock has been further considerably reduced. The deliveries last week were about 700 tons in excess of the landings, and consequently, the stock is lower to that extent. The opening of France to Coffee grown in the British Empire, without extra duty, has led to a good business in Indian, and the stock of this kind is now very much reduced. Prices have, in consequence, advanced, especially Peaberry, which is 2*s.* to 3*s.* dearer. The home consumption does not appear to increase as it should do just now, considering the large number of Belgians and French in this country, all of whom are more accustomed to Coffee than Tea. A good business has been done with them by many grocers, but there are signs, unfortunately, that the ordinary trade has declined. Quotations generally are rather dearer, especially for Santos, which has been in most demand.

London Coffee Returns.

	* Home Consumption.		Export.		Stock.	
	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons.
For week ended Nov. 7...	313	273	958	378	18,295	10,569
For 45 weeks ended Nov. 7 ...	13.169	13,097	22,175	19,378	...	...

*The Home amount contains a proportion for Export delivered by cart.

The Produce Markets Review.

TEA.

Indian Tea.—Only one sale has been held, when about 38,000 packages were offered. Rather more attention was given to the better grades, and the common sorts, which owing to the tremendous demand had almost reached the same price as the medium descriptions, were somewhat neglected in favour of more attractive Teas at slightly higher rates. There was, moreover, a plentiful supply of inferior Travancore leaf, and an easier tendency was noticeable for the commonest descriptions. Many gardens have now sold the "final invoices" of the season's crop, and as shipping arrangements from the East are causing considerable anxiety owing to high freight and shortage of ships, the position as to supplies is still very uncertain. Although the tone at Monday's sale was easier there seems little reason to hope for any substantial drop in prices. The demand from all quarters is still strong and likely to increase, and the next few sales after the holidays will be watched with considerable interest. No further auctions will be held until April 12.

Ceylon Tea.—The quantity brought forward at the auctions on Tuesday was much smaller, but a quieter tone prevailed, and, although there was practically no change, a few poor invoices sold at lower rates. Broken Pekoes fully maintained previous values, and Dusts and Fannings again realised high prices. In whole leaf kinds there were a few 10½*d.* quotations for inferior Tea, but good liquoring sorts continued in demand at recent rates. At the public auctions 18,810 packages were brought forward, nearly all of which were sold. No further sales will be held until Tuesday, April 13.

China Tea.—The private market remains firm although the volume of business done has been small. The supplies continue very restricted and the offerings have been poor and unintersting. The demand for the commonest grades has fallen off and only hand to mouth buying has been in evidence. The fine and finest Monings are firm with a steady business. There was a small auction on Wednesday, when about 800 packages of Green Tea were offered. The demand was fairly good and nearly all the lots offered found buyers.

Java Tea.—The auction was held on Tuesday and followed the Ceylon sales. The quality was in many cases poor and quotations for undesirable sorts were lower. The fine grades were well supported and firm prices resulted. The next sale will take place on April 15.

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1015.
	lbs.	lbs.	lbs.	lbs.
For week ended Mar, 27 ...	4,618,910	6,607,374	1,001,772	1,345,270
For 13 weeks ended Mar. 27	... 72,013,403	87,902,287	12.897,837	16,751,200

—*The Produce Markets' Review.*

SOIL.

The Evaporation of Water from Soil.

KEEN, B. A,

The relation between soil and evaporation was studied by measuring the rate of evaporation from moist soil maintained at constant temperature over concentrated sulphuric acid. An apparatus was fitted up by means of which it was possible to make successive weighings without removing the evaporating dishes from the sulphuric acid chambers, and thus to reduce very considerably the experimental error.

The soil fractions, fine sand (0'2—0'04 mm.) and silt (0'04—0'01 mm.), a sample of pure china clay and two soils were used in the experiments, and when the rates of evaporation were plotted, curves were obtained which were continuous over the whole range, showing that there was no abrupt change in the physical state of the water between the limits experimented upon, (*i.e.*, from about 25 per cent, of water to dryness.)

When a tray of moist sand or silt was suspended over sulphuric acid, the rate of evaporation was largely determined by the rate of diffusion of the water vapour from the sand to the acid, and the observed results agreed closely with those calculated from the laws of diffusion. But soil behaved differently, the process of evaportion being so influenced that the comparatively simple laws holding in the case of sand or silt no longer applied. The soluble humus was then removed from a sample of soil by means of a 2 per cent. caustic soda solution, but the soil still behaved as before ; ignition, however, completely altered the character of the evaporation which became precisely similar to the evaporation from sand or silt. Ignition on the other hand did not affect the behaviour of sand or silt, so that the difference between ignited and unignited soil cannot be ascribed to loss of organic matter, but should rather be attributed to the destruction of the colloidal properties of the soil. Further confirmation of this view was obtained by experiments on the china clay sample which possessed only very feeble colloidal properties and yielded an evaporation curve practically identical with that given by fine sand.

Further information on the process of evaporation was obtained by a mathematical examination of the rate curves for soil. Two factors have been distinguished which operate over practically the whole range of water content dealt with in these experiments. In the first place the simple linear relationship observed with soil, the curve being more nearly exponential in character: and indicating that the relationship of water to soil, is quite different from its relationship to sand, a circumstance which has already been traced to the colloids. This relationship has only been expressed empirically, but it is probably connected with the relation between vapour pressure and moisture content. As the curve is not of a simple exponential type another factor must also be at work, *i.e.* the effect or evaporation of the decreasing water surface in the soil, the surface obviously diminishing as evaporation continues.—*Monthly Bulletin of Agricultural Intelligence and Plant Diseases.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 25.] JUNE 19, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Proceedings of the Annual General Meeting of the Kanan Devan Planters' Association are published and will be found of general interest. We note that this Association has joined the T. C. P. A. and we wish the combined Association every success, as such a combination is bound to work for the good of the whole Planting Community.

We publish an article furnished to us on "The Agricultural Statistics" based on the first volume for British India. The whole article is informing and puts on record, and within a small space, very valuable information. Of the total land irrigated, the Madras Presidency claims no less than 22 per cent. of the whole. How vitally important is the Agricultural Industry in India will be seen from the fact that food crops account for 83 per cent. of the different crops raised.

A correspondent has asked us to mention the fact that he is urgently in need of some good Jamaica Seed coffee. If any of our readers are in a position to supply this, we shall be happy to place them in communication with the applicant.

A reply from the Government of Madras asking for information about Weights and Measures reads as follows:—

> "The Government have not yet received copies of the Report of the "Committee appointed to examine the question of the standardi- "zation of Weights and Measures, but they have reason to believe "that it will shortly be published."

This Committee was appointed in 1913.

We understand that the Board of Revenue has been requested to submit a draft Bill on the lines of the Madras Cattle Diseases Act, on the control and extermination of the pests and diseases within British India. The Cattle Disease Act enables the local Government to notify areas as infected, and then take special measures to combat disease within those areas. A Pest Act drawn on the same lines would meet the wishes of the Planting Community.

A circular is being issued from this Office appealing to Honorary Secretaries to complete and send in full list of those members and their Districts who have gone to the Front, for publication.

DISTRICT PLANTERS' ASSOCIATIONS.

Kanan Devan Planters' Association.

Proceedings of the Annual General Meeting of the above Association held in the High Range Club, Munnar, on the 15th May, 1915, at 3 p.m.

PRESENT.—Messrs. C. Fraser (in the Chair), J. M. Bridgman (Vice-Chairman), W. O. Milne, A. H. Dixson, G. E. Bewley, J. C. Abbott, A. W. L. Vernede, A. B. Hill, G. R. Strachan, J. S. B. Wallace, G. Walker, J. B. Ingram, L. H. Ley, E. L. Koechlin, H. W. Leamon, E. H. Francis, D. V. Crowe, G. W. Cole, J. S. Hawkins, W. A. Lee, J. C. Swayne, A. J. Wright, A. Yates, A. W. John, Dr. J. S. Nicolson, M. D., S. C. H. Robinson (Honorary Member). *Visitors*:—G. H. House, H. J. Watson, E. L. Hammick, C. Rowson.

The Notice calling the Meeting having been read, the Minutes of the Bi-Annual General Meeting having been printed and circulated, were taken as read and confirmed.

The following Agenda was then laid on the table:—

(1) Chairman's Speech.
(2) Honorary Secretary's Report.
(3) Accounts.
(4) Labour Laws, etc.
(5) Post Office.
(6) Game Laws.
(7) Bangalore Delegates's Report.
(8) Srimulam Delegate's Report.
(9) The L. A. N. I. Fund.
(10) The S. I. P. B. Fund.
(11) Correspondence.
(12) The Travancore Combined Planters' Association
(13) Election of Bangalore Delegate.
(14) Roads.
(15) Election of Office-bearers.

On opening the Meeting, the Chairman said there was a lengthy Agenda before them and he did not wish to detain them by making a long speech. He was very pleased to see so many members present, and would ask their permission to allow the position of the items Nos. 1 and 2 on the Agenda to be changed. After hearing the Honorary Secretary's report he would then make any remarks that he might think necessary. This was agreed to unanimously.

The Honorary Secretary then read his report, as follows:—

Mr. Chairman and Gentlemen,—I beg to lay before you my Annual Report for the past year.

MEMBERSHIP.—There are 36 members on the Register, all of whom have agreed to pay the increased rate of subscription.

During the year, the Bi-Annual General Meeting and 4 Committee Meetings have been held. I am glad to say that all were well attended.

FINANCE.—I am pleased to be able to place before you a very much more satisfactory report than the last year when the Association closed its books with a small debit balance. Partly owing to the fact that neither the Bangalore Delegate, nor the Srimulam Delegate drew their allowances, but chiefly owing to the increased subscription which has been sanctioned and paid, the Association's year closes with a credit balance of some Rs. 450.

ACREAGE.—There are 1,411 acres of Cardamoms,
1,037 acres of Coffee, and
781 acres of Rubber, all doing well.

The total acreage under tea is 19,858 acres, or an increase on last year's of 1,061 acres. The average yield per acre amounted to 580 lbs, as against 537 last year and the average price was 8'93*d.* as against 8'75*d.* last year, which is very satisfactory. Owing to the War all conditions have been changed and Freights and Insurance had been largely increased, but I am glad to say that these have been more than counter-balanced by the increased price which our teas have lately been obtaining both at Home and in Colombo. There is every hope that the Continental markets will show a very marked increased demand for teas in the near future. Altogether prospects for tea may be considered as most satisfactory.

MEDICAL GRANTS from His Highness' Government have been regularly paid and the Association is very grateful for this consideration. I have again to express my regret that the Government have not yet, however, seen their way to make any further increase in the grants in this direction, but this we must hope will come in time.

POSTAL SERVICE.—I regret to say that since our last General Meeting the Postal Service has degenerated both in efficiency and despatch. The Association has approached the Government in the hope of having matters placed on a more satisfactory basis.

SCIENTIFIC OFFICER.—This question will be brought forward under the heading of correspondence, and it is matter for members to decide as to whether we are receiving full value for the very large sum we are at present annually subscribing to this Department.

GAME LAWS.—This question will also be brought up and discussed during the Meeting. It is a matter for regret that in spite of our efforts, things are still in a most unsatisfactory condition, in fact, going from bad to worse. It is to be hoped that under the new Government Regulation things will improve.

THE L. A. N. INSTITUTE.—The Association is still paying its subscription to this, and many members this year have found the services of its nurses of the utmost benefit.

SRIMULAM DELEGATE.—Mr. Wright was again our Representative at the last Meeting and as usual his thorough and careful work was most successful. We shall have the pleasure of hearing his report later on.

ACCOUNTS.—The Balance Sheet and the books of the Association are on the table, and I trust that later they will be passed. I shall have the pleasure in proposing a hearty vote of thanks to Mr. J. B. Ingram for his kindness in auditing them.

THE S. I. P. B. FUND.—I trust all members will continue to subscribe to this most admirable Institution. I may mention that it has been of con-

siderable benefit to one of our late members and other Planters who have fallen temporarily on hard times.

THE T. C. P. ASSOCIATION.—A proposal was made some time ago for a combination of all Travancore Associations. The first proposal and rules did not recommend themselves to the Committee, and it was decided to ask Mr. Wright to go into the matter when in Trivandrum at the Srimulam. This he did and will be able to fully explain the object of the new Association and it will then rest with you whether this Association joins, or not.

LABOUR LAWS have worked satisfactorily during the year, but there are several points to be brought forward for discussion and settlement under this heading.

ROADS.—The question of roads and their upkeep is again before you for consideration and discussion. Although it must be admitted that Government, as far as allotments of money goes, has been extremely liberal, the work in many places seems to hang fire, and it is to be hoped that more effectual results may be obtained as to the general condition of the roads in the District in the near future and more rapid progress made with roads under construction.

BANGALORE DELEGATE.—I had the honour of being elected as your Representative at the U. P. A. S. I. Meeting, but circumstances prevented my attendence. This was a matter of extreme regret as had I been able to go to Bangalore, I should have had the honour of occupying the Chair at one of the most important Meetings in the Association's history. I consider that the position of Chairman of the U. P. A. S. I. is the highest honour to which any S. I. Planter can aspire with the exception, perhaps, of that of Planting Member. I have to thank you most heartily for having done me the honour of electing me for 3 years in succession. Mr. H. L. Pinches very kindly undertook to take my place, and from the printed reports of the Proceedings which you have doubtless seen, he most ably filled the position, and we are due him a very hearty vote of thanks for his efforts in forwarding our interests.

THE NEW LABOUR DEPARTMENT is now getting into its stride, and I feel confident that we shall all benefit in the near future from its work. It is a mattter for regret that we are all not united in opinion on this subject, but I am in hopes, as I am sure you all are, that when its good results begin to make themselves felt, those outstanding at present will come into the fold.

With reference to the War, I may mention that several of our members have offered their services and are in some cases actually engaged at the Front. I am sure you all wish them all good luck and a safe conduct through the perils and dangers they are bound to encounter. I beg to move that they be elected Honorary Members of the Association.

The Chairman then said:—

Gentlemen,—After hearing Mr. Hughes' very able and detailed report, there is very little left for me to say. It is worthy of note that the area under tea has increased by over 1,000 acres, and I think this increase is likely to continue. It is also very satisfactory to note the excellent prices that had been, and are still being, obtained for our teas. No one seems to know the reason for this increase in price, but let us hope it may long continue with beneficial results to us all as regards commission.

The Accounts and Books are on the table before you, and I beg to move that as they have been audited and certified as correct, they be adopted.—Carried *nem. con.*

It is very satisfactory to find that our financial position is now so much improved, and I think we are due a very hearty vote of thanks to the Directors, Owners and Shareholders who so kindly sanctioned the increase of subscription to which this satisfactory position is chiefly due.

It is a matter for regret that the Postal Service has again deteriorated. It had been brought to a very most satisfactory state, but has recently fallen off. There are one or two Resolutions to be put before you later on in this connection, and I trust our representations will result in benefit to all concerned.

I am glad to note that the question of Game Preservation is again receiving your careful attention. The Government are doing their best to help us, but much remains to be done if really good results are to be forthcoming. The Committee will recommend a Working Committee and I trust you will agree with their proposal.

A good deal of sickness unfortunately has occured during the year and many members have to thank the Nurses sent up by the L. A. N. Institute for their help and kindness. I think the Association should continue its subscription to this Institution.

A list will be circulated for subscriptions, to the S. I. P. B. Fund, and I trust you will all contribute liberally. We, as an Association, are receiving help for one of out late members, and relief has been afforded to to brother-planters in deserving cases.

The question of the Association joining the T. C. P. A. is up for discussion and settlement. Personally, I think the idea is a good one and that we should join. Mr. A. J. Wright will presently describe its objects and we can then decide what steps are to be taken.

The ever-present question of Roads is again before us, and we can only hope that Government will continue to be liberal and help us in this direction.

Owing to ill-health, Mr. Hughes, although elected, was unable to attend the Annual Meeting of the U. P. A. S. I. Mr. H. L. Pinches at the last moment very kindly consented to take his place, and we were most ably represented. I think we owe Mr. H. L. Pinches a very hearty vote of thanks for the good work he did in this direction.

I heartily concur, as I am sure you all do, with the Honorary Secretary's proposal that those of our members now at the Front and engaged in the War be elected Honorary Members of this Association. I beg to put this proposal to the Meeting.—Carried *nem con.*

As we have a long Agenda, I will not detain you longer. We will pass on to the next item in the Agenda. But before sitting down I should like to point out, especially to the younger members amongst us, who no doubt are keen to get away to the Front, that they are all equally doing their duty by sticking to their present posts, monotonous and uninspiring as the work on a Tea Garden may be, particularly under the present conditions.

The Honorary Secretary then placed the Statement of Accounts and Balance Sheet before the Meeting. The Chairman then proposed that they be adopted and approved. The Honorary Secretary then proposed a vote of thanks to Mr. J. B. Ingram for his kindness in auditing the Accounts.—*Carried unanimously,*

The Chairman then proposed a hearty vote of thanks to the Directors, Owners and Shareholders for sanctioning the increased rate of subscription

which has placed the Association in a sound financial position.—*Carried unanimously.*

The Chairman then stated that he withdrew the proposal to alter Rule 4 of the existing Labour Law and the following Resolution proposed by Mr. J. C. Abbott and seconded by Mr. G. Walker, was then put to the Meeting and after some discussion, carried.

> "That Messrs. James Finlay & Co. be approached to know whether they will have any objection to letting the K. D. P. A. be informed of any proposed change in the rate of their coolies' pay, rates of advances, or concession to coolies, so that all members of the Association may work together on the same lines as far as possible."

A Resolution with regard to Maistries, sent in by Mr. J. S. Hawkins having been received too late, could not be discussed, but it was left for the Committee to deal with.

The following Resolution was then proposed by the Chairman and carried unanimously:—

> "As under the existing arrangements it takes a letter 2 or 3 days to get from the Devikolam Post Office to Surianalle Post Office, a distance of only 10 miles, this Association would urgently request the Postal Authorities to link up these Post Offices."

The Honorary Secretary then read the Postmaster-General's letter No, M. C. 90 and was asked to write and inform him that specific instances of Postal irregularities would be if possible obtained and brought to his notice and to request that efforts be made to ensure regular working of the various Post Offices in the District.

The following Resolution proposed by Mr. J. C. Abbott and seconded by Mr. A. W. L, Vernede was then put to the Meeting and carried unanimously:—

> "That the Postmaster-General be asked to establish a direct Postal commuication between Udamalpet and Talliar."

The question of Game Laws was then brought up, and after considerable discussion, it was proposed by Mr. W. O. Milne and seconded by Mr. W. A. Lee.

> "That the following members be elected to act as a Game Committee: Messrs. A. W. John, C. Fraser, A. G. Murray, S. C. H. Robinson, J. C. Swayne, A. J. Wright, J. C. Abbott and A. W. L. Vernede,"—*Carried unanimously*

The Chairman then proposed that as the Proceedings of the U.P.A.S.I. have been printed and circulated, the Delegate's Report be adopted and that a very hearty vote of thanks to Mr. H. L. Pinches be passed by the Association.—*Carried unanimously.*

Mr. A. J. Wright, the Srimulam Delegate, then read his report which was listened to with much interest and attention. The Chairman then said that they were deeply indebted to Mr. Wright for the very careful and able way in which he had represented their interests. The collection of details, etc., etc., must have cost Mr. Wright considerable time and work and he begged to propose a most hearty vote of thanks to Mr. Wright for what he had done.—*Carried unanimously.*

Mr. Wright thanked the Meeting for their kindness and said that it had been a great pleasure to do what he could to forward the interests of the Association in every way.

It was then proposed by Mr. J. C. Swayne and seconded by Mr. A.Yates.

"That this Association continue to subscribe to the L. A. N. I. Fund.—*Carried unanimously.*

A list of subscriptions towards the S. I. P. B. Fund was then handed in to the Chairman who said he was pleased to state that Rs. 248 had been promised by members present. He suggested that the Honorary Secretary write to all other members not present for further subscriptions.

The Honorary Secretary then read a letter from the President of the District Board, Madura, with reference to the Light Railway from Madura to Bodinayakanur. The Association noted with satisfaction that progress was being made.

The Honorary Secretary then read the U. P. A. S. I. Circular No. 3/15, with reference to the date of the Annual Meeting. Members agreed that the date fixed was suitable and asked the Honorary Secretary to write the Secretary of the U. P. A. S. I. to this effect.

The Honorary Secretary then read a letter from the S. C. H. Robinson, Esq., with reference to the engagement of Military Pensioners on Estates. It was decided that if any member requires services of one of these men, he should apply to the Honorary Secretary for particulars.

The Honorary Secretary then read the U. P. A. S. I. Circular No. 4/15 with reference to the Annual Exhibition to be held at Bangalore in conjunction with the Annual Meeting and also with reference to the keeping of a record to be published from time to time in the *Chronicle* of those Members of Associations who were serving in the War. The Chairman stated that he hoped members would send as many Exhibits as possible forward to Mr. Norton and the Meeting approved of this suggestion to send in a list of their members who were engaged in the War.

Mr. A. J. Wright then moved the following Resolution which was seconded by Mr. Hughes.

"That in support of the general planting interests in Travancore this Association joined the T. C. P. A,"

The Meeting then went into Committee and after considerable discussion on return to open Meeting, the Resolution was carried by 17 votes to 5.

The Chairman then proposed Mr. W. A. Lee be elected as Delegate to attend the General Meeting at Bangalore, in August—*Carried unanimously.*

The Chairman then proposed the following Resolution: –

"That the Association ask the Government for an additional grant of Rs. 500 for repairings storm damages on the Bodi Mettu Ghat Road." He pointed out that the recent North-East Monsoon had been one of the heaviest on record and that very considerable damage had been done to revetments, drains and the road surface generally. He had spent Rs.1,086 in 1914 and Rs.600 in 1915 in upkeep and repairs and had received the usual annual grant. This fell short of the actual requirements by Rs.500 and he hoped the members present would approve of his Resolution. This was carried unanimously.

Before resigning the Chair, Mr. Fraser wished to move a very hearty vote of thanks to Mr. Hughes for the work he had done for them during the year. The running of an Association like theirs entailed considerable expenditure of time and he was sure all agreed that Mr. Hughes has fulfilled his duties in a most thorough, careful and satisfactory manner. A vote of thanks was passed unanimously.

Mr. Hughes in thanking the Meeting for their hearty and kindly appreciation of his efforts, said that he took the very keenest interest in the well-being of the Association and was extremely gratified to feel that his efforts met with their thorough approval.

The Chairman in resigning, begged to thank the Vice-Chairman, Honorary Secretary and Members of the Committee for the kindly way in which they had supported him during the past year. He had to thank Mr. J. M. Bridgman, the Vice-Chairman particularly for helping him on several occasions when he was unable to attend and also the Honorary Secretary for the able way in which he had helped him to carry out the work of the Association.

The other members of the Executive having resigned, Mr. J. C. Abbott was then temporarily voted to the Chair. The election of Office-bearers for the ensuing year then took place.

Mr. C. Fraser was unanimously re-elected Chairman.

Mr. E. A. Hughes „ „ Honorary Secretary.

Balloting for the Committee resulted in the election of—Messrs. A. J. Wright (Vice-Chairman), A. Yates, W. O. Milne, W. A. Lee and A. W. John.

On resuming the Chair, Mr. Fraser said he had to thank them very heartily for the honour they had done him in re-electing him as Chairman for the 4th year in succession. He felt that it would perhaps have been more to the interests of the Association had they elected someone else in his place, but he could assure them he would do his utmost to back up the interests and carry on the work of the Association to the best of his ability.

Mr. Hughes thanked the Meeting very heartily for the honour they had done him by his unanimous re-election. He hoped shortly to be going home, but in the meantime the work of the Secretaryship would be carried on by Mr. G. A. Holden who had very kindly consented to carry out the duties in his absence.

Mr. Wright thanked the Meeting for the honour of electing him to the Vice-Chairmanship and the Members of the Committee also thanked the members for the honour done them.

Papers on the Table—

The U. P. A. S. I. Circulars.

The Indian Tea Association Circulars,

Correspondence and the Association books, etc., etc.

A vote of thanks to the Chair terminated the Proceedings.

(Signed) C. FRASER,
Chairman.

(„) ERNEST A. HUGHES,
Honorary Secretary.

STATISTICS

Agricultural Statistics of India.

The first volume of the Agricultural Statistics for British India for 1912-13 has just come to hand and contains much that is of great interest. The annual publication of these statistics was begun in 1886 and this is the 29th volume of the series and it contains several new features, useful summary tables being inserted. The Statistics are compiled from annual returns furnished by the Local Governments and Administrations.

The total area of the British Provinces dealt with is 748,869,000 acres, and includes 129,942,000 acres with a population of 26 millions belonging to Feudatory and Tributary States which are under the control of Local Governments and Administrations; this leaves a balance of 618,927,000 acres as the area of British Territory. One is so accustomed to reading the stock phrases of the newspaper men about India's teeming millions, cultivating the soil, and the vast agricultural wealth of India that it comes as somewhat of a surprise, while at the same time it emphasises the vast size of India, to find the net area cropped is only 36 per cent. or 224,166,000 acres. In the Madras Presidency the proportion of cropped to total area is 38 per cent, while in Coorg it is only 14 per cent. The total area is classified as follows:—

	Acres.	Per cent. of total area.
Forests	82,400,000	13
Not available for cultivation ...	146,387,000	24
Culturable waste other than fallow ...	115,025,000	19
Current fallow	48,760,000	8
Net area cropped	234,166,000	36.

Irrigation plays a great and important part in Indian agriculture, and the total area irrigated in 1912-13 was 45,539,000 acres. Of this 17,764,000 acres were irrigated from Government canals, a measure of the immense progress which has been made with Government irrigation works; 2,493,000 acres derived their water supply from private canals, 6,825,000 acres from tanks, and 12,331,000 acres from wells. Of the total land irrigated the Madras Presidency contains a larger area than any other province, amounting to 22 per cent. of the whole: the proportion of the irrigated to the total cropped area in this Presidency was 28 per cent., in Coorg 3 per cent.

The total area under different crops in all British India is shown in the following table, from which it will be seen that food crops account for 83 per cent. of the total.

	Acres.	Per cent. of total area.
Food Grains	201,372,000	78·9
Condiments and Spices	1,390,000	0.6
Sugar	2,712,000	1·1
Fruits and Vegetables	5,466,000	2·1
Miscellaneous Food crops... ...	1,332,000	0·5
Total food crops	212,272,000	83·2

	Area.	Per cent. of total area.
Oil Seeds	14,936.000	5'9
Fibres	18,268,000	7'2
Dyes	639,000	0'2
Drugs and Narcotics	1,931,000	0'8
Fodder crops	5,770,600	2'3
Miscellaneous non-food crops ...	1,068,000	0'4
Total non-food crops	42,612,000	16'8

In this classification Tea and Coffee come under the head of "Drugs and Narcotics," and it is stated that there were 92,000 acres of Coffee in British India in 1912-13 and 558,000 acres of Tea, the former crop showing a decrease of acreage of 3 per cent. as compared with the previous year, and the latter crop an increase of 14 per cent.

In the section devoted to Land Revenue it is of interest to note that the total revenue derived from the land in Madras in the year under review was Rs.6,39,58,000; the population being 38,209,000; this amounts to Rs.1-11-0 per head. In Coorg the total revenue from the land was Rs.3,65,000 from a population of 175,000, or Rs.2-1-0 per head,

Turning now to the detailed tables we find the following figures are given.

	Madras Presidency.	Coorg.
Total area	91,067,842	1,012,260
Total area under cultivation	34,605,903	140,253
Acreages of Coffee	49,287	42,510
Acreage of Tea	23,880	—
Acreage of Cinchona	2,471	—

The Coffee, Tea, and Cinchona distributed (in acres) in the different Districts of the Madras Presidency is as follows in 1912-13:—

	Coffee.	Tea.	Cinchona.
Vizagapatam	129	—	—
Salem	8,162	—	—
Coimbatore	379	—	—
Trichinopoly	34	—	—
Madura	10,819	—	—
Tinnevelley	649	—	—
Nilgiris	23,825	12,174	2,471
Malabar	5,274	11,706	—
South Canara	25	—	—
Total	49,287	23,880	2,471

No mention is made of Rubber in this volume of statistics as far as could be observed and it is not included in the alphabetical list of crops cultivated in India which appears as an Appendix at the end of the volume. The acreage of Rubber planted in British India in 1911-12 was about 9,000 acres.

R. D. A.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 26.] JUNE 26, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish the Proceedings of the Wynaad Planters' Association and note that Messrs. B. Malcolm and N. C. Whitton have been elected Delegates to the Annual Meeting of the U. P. A.

We publish Mr. Andrew's very interesting article on Insects which will be found invaluable to all tea planters. The usefulness of the termites is noticed and it is shown "how a very important part they play in the economy of nature by helping to bring about rapid disintegration of dead vegetable matter by taking it down into the soil and by bringing sub-soil to the surface." No quite successful method has yet been found to get rid of them. Fumigation has been found successful against a species which build a nest which can be rapidly located. The whole article is informing and we are indebted to the Scientific Department of the *India Tea Association's Quarterly Journal* for it.

From the *India Rubber Journal* we extract a table of the overseas Trade in Rubber in April, and it will be noted how the imports and exports have largely increased between 1913-1915.

We publish an article entitled "Advertising by Cinema." This is one of the best methods that the Labour Department has yet put forward for attracting labour and preventing emigration. This is bound to be a success when every form of Estate life on the various estates has been reproduced and will go far to assure the would-be emigrant that remunerative and congenial labour is to be found at his very door. We wish the new departure every success.

Capital supplies us with a short para on Coffee and Tea. Though Coffee may become the universal beverage of the United States, it will hardly benefit South India except indirectly. But the future of Tea seems assured if the Tea Cess Committee would exploit Russia in preference to the United States.

With reference to the Pest Act to which we referred last week we have heard that the rules were intended to come into force from January 1st., 1915, but replies received from local Governments show that the whole subject is extremely difficult and further delay has consequently arisen before the rules can be finally issued.

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association.

Proceedings of a Meeting held in the Meppadi Club, on the 9th June, 1915.

PRESENT.—Messrs. Bisset, Blackham, Copland, Gillatt. Malcolm, McBain, Powell, Winterbotham, and N. C. Whitton (Honorary Secretary). *Visitors*:—Messrs. Craig, Dobree, Kirkby, Leslie, Mackay and O'Brien.

Mr. Powell in the Chair.

1964. *New Member.*—Mr. M. E. M. Blackburn was elected a member.

1965. *Proceedngs of Last Meeting*—were confirmed.

1966. *Roads. Vayitri to Sultan's Battery.*—Read letter dated the 16th March, 1915 from the Executive Engineer, West Coast Division *re.* this road, stating that, "a special estimate for putting the road into thoroughly good order is under preparation, and it is hoped that it will be sanctioned shortly. This estimate will be additional to that for doing the usual annual repairs."

Read Honorary Secretary's reply. Members present, who had been over this road recently, stated that very little work has been done, as yet.

District Road No. 31.—The Honorary Secretary was instructed to draw the District Board Engineer's attention, (1) to the bridge at about the 1st mile 3rd furlong from Vayitri, where the diversion is in a disgraceful condition and the repairs to the bridge are proceeding very slowly. (2) To the bridge about the 4th mile 2nd furlong where the repair work is not being proceeded with in spite of materials being ready at the site. The condition of this bridge being at present a source of danger to the public. (3) To the bridge near the Achoor Factory which is also in a dangerous condition. Here also the repair work is being proceeded with very slowly.

The Honorary Secretary, also to ask the District Board Engineer if these repairs cannot be attended to more promptly.

Calicut-Wynaad Road.—A resolution was passed unanimously· "That the Executive Engineer, West Coast Division be written to, pointing out that the bridge at mile 24-1 is still under repair and impassible. That the temporary bridge and diversion are certain to be impassable, is not washed away entirely, in the first heavy burst of the monsoon; and that should either of these eventualities happen, it will cause the greatest inconvenience to the District and prevent produce being sent down. The Association trusts that the matter will receive the special attention of the Executive Engineer, and that the repair work will be treated as very urgent and completed with the least possible delay."

The Honorary Secretary was instructed to forward a copy of this resolution to the Collector of Malabar and to draw the Collector's attention to same.

1967. *Post Offices.*—As nothing further has been done with reference to the keeping open of the Meppadi Post Office from 6 a. m. to 6 p. m. the Honorary Secretary was instructed to write to the Postmaster-General on the matter, and to point out to him the inconvenience the present hours cause to members who reside at some distance from Meppadi.

Correspondence *re.* the proposed Sultan's Battery Telegraph Office was read and noted.

Correspondence *re.* the Vellera Malla Post Office was also read, and the Honorary Secretary was asked to write again to the Superintendent of Post Offices, Malabar Division, with reference to the removal of this Office to a site on Pootoomulla Estate.

1968. *Labour Law.*—Correspondence *re.* the Association's High Court case, concerning Section No. 35 of the Planters' Labour Law, was read and confirmed.

The Acting District Magistrate of Malabar's report, on the working of Act I, in this District, during the year 1914, was read by the Chairman.

1969. *District Board. Membership.*—Read correspondence between Dr. Milton and the Honorary Secretary. The Honorary Secretary was instructed to write to the President of the District Board and ascertain if Dr. Milton is still eligible to hold the position as the Association's District Board Member, although Dr. Milton has temporarily left the District.

1970. *Hospital Ship "Madras."* The Honorary Secretary announced that the sum of Rs.225 had been subscribed by members and others, as a contribution to this cause. A letter was read from the Honorary Secretary, Malabar District War Funds Committee acknowledging, with thanks, receipt of this amount.

The list of subscribers was laid on the table.

1971. *U. P. A. S. I. General Meeting.*—The Secretary of the U. P. A. S. I.'s letter was read announcing that the Annual General Meeting will take place on August 16th, 1915. Messrs. B. Malcolm and N. C. Whitton were elected as the Association's Delegates.

Planting Exhibition.—Members are informed that this will be held at the U. P. A. S. I. Offices; and that exhibits should reach Bangalore not later than August 1st, 1915.

Preliminary Agenda.—The proposed Agenda was read through, and members asked to bring forward any subject they wish discussed, at the next meeting; also, any original proposal they may wish to make.

1972. *Cardamoms.*—Read Mr. Anstead's letter *re.* the sale of this product locally, and the Honorary Secretary's reply. Noted.

Papers on the Table.—(1) Copies of Southern India Planters' Benovelent Fund rules. (2) Copies of the Memorandum and Articles of Association of the U. P. A. S. I. (3) Copies of the pamphlet on "Hookworm disease and how to prevent it" by Major Clayton Lane, I. M. S.

A vote of thanks to the Chair terminated the Meeting.

(Signed) S. H. POWELL,
Chairman.

(„) N. C. WHITTON,
Honorary Secretary.

ON INSECTS.

By

E. A. ANDREWS, B. A.

PART III.

The third order of insects is known as the *Neuroptera*, and its members are characterised by having biting mouth-parts, and two pairs of membranous wings provided with numerous veins. This order contains many families whose relationships are not clearly understood, and as to the classification of which there is much difference of opinion. Some of them resemble the *Orthoptera* in structure and development, while others bear considerable resemblance to the *Lepidoptera* (butterflies and moths). Some of the forms are wingless, while others possess wings. Some undergo a more or less complete metamorphosis, that is to say, they have distinct larval, pupal, and imaginal or adult stages, while others emerge from the egg in a form very similar to that of the adult, which form they retain, except for alterations in detail, throughout their life-history. The various families are classified, for convenience, into groups as follows :—

NO METAMORPHOSIS.

1.	*Mallophaga*	...	...Bird lice.
2.	*Pseudoneuroptera*	... *Embiidae*	...
		... *Termitidae*	...White ants or Termites.
		... *Psocidae*	...Book-lice, Death-watches.
3.	*Neuroptera amphibiotica*	... *Perlidae*	...Stone-flies.
		... *Odonata*	...Dragon-flies.
		... *Ephemeridae*	...May-flies.

METAMORPHOSIS.

4.	*Neuroptera Planipennia*	... *Sialidae*	...Alder-flies.
		... *Panorpidae*	...Scorpion-flies.
		... *Hemerobiidae*	...Lace-wing flies, Ant lions, &c.
5.	*Neuroptera trichoptera*	... *Phryganeidae*	... Caddis flies.

Only two of the above families, the *Termitidae* and *Psocidae*, contain members which have been found to attack the tea plant, but certain of the other families, the *Odonata* and *Hemerobiidae*, contain members which, by feeding on other insects, afford a certain amount of assistance in keeping down pests of various kinds.

Mallophaga.—Bird-lice or biting-lice. These are small, flattened, wingless insects bearing a superficial resemblance to the ordinary headlouse. The latter, however, belongs to a different order of insects, and sucks the blood of its host, whereas the former are provided with distinct jaws, and feed on the feathers, skin, and scurf of their host. The *Mallophaga* are chiefly confined to birds, but a few have been found on mammals. Very little is known of the lifehistory of these curious insects, as they never leave the body of the host and die very soon after the bird is killed, or if removed from the living body. The egg is attached to the feathers, and the young bears a remarkable resemblance to the adult. By their movements and by constantly biting the skin lice cause serious irritation which weakens the host and renders it liable to various diseases. Chicks affected by lice are greatly weakened, and very subject to diarrhoea. Howlett recommends that fowls, &c., which are infested with bird-lice should be carefully brushed

with a non-irritant vegetable oil (not paraffin or crude oil). American authors suggest dressing the fowls with kerosene or a mixture or plaster of Paris and carbolic acid, or slaked lime and sulphur, and at a recent meeting of the Texas State Farmers' Institute the methods recommended were: (1) to dip the fowls into a 2 per cent. solution of chlorine, (2) to dust the fowls with a powder prepared by mixing one pint of a 2 per cent. solution of chlorine with half a pint of gasolene, and adding as much air-slaked lime to the mixture as it will take up, stirring thoroughly whilst it is being added. The powder should be used sparingly.

Embiidae.—These are small delicate insects which occasionally come to light, but are not likely to be noticed by the casual observer. Very little is known about them.

Termitidae.—Termites, or White Ants. These insects are included in the order *Neuroptera* chiefly on account of the structure of the wings of the males and females, of which there are four, similar in size and appearance, which lie flat on the back when the insect is at rest, and extend beyond the posterior extremity of the body. In their general structure, and in the arrangement of the mouth parts, they bear more resemblance to the *Orthoptera*, and in their mode of life they resemble the ants, which are included in an order of insects (the *Hymenoptera*) to be described later. Termites are familiar, to a certain extent, to all who have lived in India. The small white workers and soldiers, with their brown heads, which are to be seen running about in all directions when a nest is opened, and the winged adults which emerge in myriads at the advent of the rains, are well known to every tea planter. Yet, in spite of the fact that damage done annually to crops in British India alone runs into millions of pounds sterling, it is only of recent years that the study of termites has been undertaken systematically, and even now comparatively little is known with certainty of the economy, of these insects. The winged forms, which emerge in swarms at the beginning of the rainy season, are the sexual members of the community, the males and females. They possess biting mouth parts, and compound and single eyes, and are characterised by the presence of the two pairs of similar wings referred to above. At the base of each wing is a kind of imperfect joint, or line of weakness and the wings can be voluntarily severed by the insect at this line. These winged forms pair off at the time of swarming, cast their wings, and enter the ground. Three or four days afterwards they may be found some six inches to a foot below the surface, the depth varying with different species. Here they construct a small nest, and the female lays a few eggs, which develop into 'workers' (See below). These assist in the construction of the nest, and in looking after further batches of eggs, and when the nest has become sufficiently well established, the female begins to increase in size, and ceases to take an active part in its construction. This increase in size is caused by growth of the generative organs, and goes on until the insect becomes a helpless sac of eggs, incapable of movement, which must be fed and tended by the active workers. In this state she may exist, as the "queen termite" of the colony, for years, extruding eggs continuously. The male does not increase in size, but after a time he also ceases to be an active member of the colony, and lives, with the queen, in a special cell which is known as the 'royal cell,' he being known as the 'king termite.'

The eggs which are laid by the queen give rise to three types of individual, known respectively as 'workers,' 'soldiers,' and 'nymphs.' The first two types form the active portion of the community, and are the small insects which are to be seen running about the nest when it is broken into.

In general appearance they are somewhat similar, the head being brown, the body segments distinct. In the worker, however, the jaws are adapted for biting and chewing, while in the soldier the mandibles are prolonged into a formidable-looking pair of prongs, eminently fitted, in appearance at any rate, for purposes of attack and defence. The head of the soldier, too, is usually larger than that of the worker. The nymphs are the young of the sexual form, and differ from them only by the absence, or in the rudimentary condition of, the wings. Small milk-white active forms, which are also to be seen in a termite's nest are the young of the soldiers and workers.

The workers, soldiers, and winged sexual forms are the three types, or 'castes,' as they are called, of members found in termite communities, but there is great variety, in different species, in the relative proportions of the different 'castes.' In some species, too, there may be two kinds of worker, in others two kinds of soldier, and some of the nymphs may never leave the nest at all, but be fertilised there and remain as 'accessory' or 'substitution' queens. It has been popularly supposed that the several castes of termites always hatch from the eggs in the same form, and that the differentiation into castes is brought about after birth by some difference in the mode of feeding, but recent researches have shown, in the case of *Eutermes* and *Termes* at any rate, that the young soldier hatches from the egg in a form resembling the full-grown soldier, and that differentiation must therefore take place in these forms during egg stage. This is probably the case with the worker also, but still remains to be proved.

The workers, as their name implies are the working members of the community. They are incapable of reproducing their kind, and all their energies are devoted to the construction of the nest, the obtaining of food, and rearing the young termites. The soldiers are also incapable of reproduction, and their function appears to be the defence of the colony. The winged forms take no active part in the economy of the nest, and their duty is to reproduce and disseminate the species.

The white ants which attack tea may be divided into two groups, those which build a mound and those which do not. In such of these groups there are several species, and until every species has been properly worked out, it is impossible to give a detailed description of the nest of each. A general description of a termite nest may, however, be of interest. On opening up the soil, the first thing to be seen is a number of galleries, running in all directions. These communicate with a few main galleries leading down into the nest. A little further digging will bring to view cells or chambers, containing a dark gray spongy mass covered with small white globules. This spongy mass is known as the 'comb,' and is composed of small grains of masticated organic matter cemented together. The white globules are fungi, which the termites are supposed to cultivate for food. It seems probable, in fact, that the depredations caused by termites are due, not to their actually feeding on the substance attacked, but to their removing the material for the purpose of constructing the comb on which the fungi are grown. These fungi are found in all termite nests, and the very young termites and nymphs are almost invariably to be found in a chamber containing a fungus comb. At some part of the nest will be found a smooth chamber containing the king and queen. This is the royal cell. A network of galleries connects the various chambers with the surface and with one another. The disposition of the chambers in the nest varies in different species, and to a certain extent in different nests of the same species, and the general shape of the nest may of course vary according to circumstances.

Termites must play a very important part in the economy of nature, by helping to bring about rapid disintegration of dead vegetable matter by

taking it down into the soil, and by bringing subsoil to the surface. In tea gardens, however, where the available vegetable matter consists mainly of tea bushes and shade trees, the insects, in their search for material, are apt to go beyond the limits of usefulness and become a nuisance by infecting the bushes. Any dead snag on a bush is immediately attacked, and provides a direct means of entry to the heart wood. This may be eaten away and the sap-wood left, and the bush, though hollow and full of termites, continues to flush. As the insects work along, they put a layer of earth against the sap-wood, which dries the latter, hinders the free circulation of the sap, and weakens the bush still further. This process goes on until the bush is killed. In other cases, the insects obtain entry into a branch at a wound, caused, may be, by a slip of the knife in pruning, by a blow from a hoe, by cattle, or by a boring insect. By means of a layer of soil on the wound they extract moisture from the spot and prevent the process of healing. As the outside wood dies it is eaten away, and eventually the flow of sap past the wound is prevented, and the upper part of the branch dies back. The lower part is killed more gradually, but the termites work along it until they get to the heart of the bush. Another means of entry is by way of an injured root. At certain times of the year, especially towards the end of the plucking season, the bushes become noticeably full of 'white-ant mutty.' This may be accounted for by the fact that cultivation is more or less at a standstill at this period, and of course, with the cessation of the heavy rains it becomes possible for the termites to build in the bushes. The removal of moisture from living-wood, too, would be a difficult, if not impossible task, during the rainy season. Close observation leads one to believe that the objective of the white ant runs found on the bushes during the cold weather, is the dead wood which is to be found there, and in the majority of cases these runs can be traced to some piece of dead wood, either a snag left at the last pruning or a branch which has been broken or has died back, or to some place where a branch has suffered injury. Very often the branches covered by these runs show no signs of injury, but in some cases the outer layer of bark is found to have become dry and to have been partly removed. When young bushes are planted out, it is found that those planted on white ant 'teelas' grow sickly and finally die out. When dug up they may or may not show signs of termite attack, such attack being a consequence, and not the cause of the death of the plant. Certain other crops, on the other hand, grow better on this soil than on the surrounding soil. This may be due to the fact that the white-ant soil, though chemically as rich or even richer than the surrounding soil, is mechanically unsuited for tea, and that an alteration in its texture may be necessary before tea can be successfully grown on it. The matter is under investigation.

Many remedies have been tried against these pests, but so far with only a small measure of success. Substances which have been found to have some effect as deterrents in the case of termites attacking trees are, a ten per cent. solution of sodium arsenite, kainit, 'Terracide,' and a mixture of corrosive sublimate and sugar. Oil cake seems to be obnoxious to these insects in a small degree. Posts can be more or less protected from the inrods of white ants for two or even three years by thorough soaking in either a saturated solution of bluestone (copper sulphate) or a ten per cent. solution of sodium arsenite, or Atlas compound, and railway sleepers are treated by exhausting the cells of the wood, as far as possible, of air, and replacing this air by creosote.

One method of destroying termites, the method of fumigation, has been found successful against species which build a nest which can be

readily located. An account of an experiment with a machine designed for this purpose has been given in a previous number of this journal and the same machine has since been used on several occasions with success. Although no practical method of destroying or driving away termites on a large scale has yet been devised, their attacks can be mitigated, to a great extent, by care and attention at the time of pruning, and by thorough cultivation and thullying round the bushes.

Psocidae.—This family includes the book lice and death watches, and contains at least one species which attacks tea in the field. The members of this family are small delicate insects with hair-like antennae, and four membranous wings, of which the front pair is the larger. When the insect is at rest, the wings lie over the sides of the body, with the hind edges meeting in a line over the middle of the back. Metamorphosis is slight, and the young very much resemble the adult. *Psocus tabrobanes* Hagen, is a species which occasionally attacks tea in Assam and the Duars, congregating on the stems of the bushes and eating the bark. Another species has been found to attack stored tea dust in Assam.

Perlidae.—The stone-flies are not likely to come before the notice of the tea planter. They are moderately large insects, having four membranous wings, each with a net work of veins, the hind pair being larger than the front pair, and folding beneath them when the insect is at rest. They live in water in the larval stages.

Odonata.—Dragon-flies are common in the tea districts, and play a useful role in devouring various plant-feeding insects. They are easily recognised by the long narrow body, the large mobule head with its enormous eyes, and the two pairs of membranous wings, which are held horizontally at right angles to the body when the insect is at rest, as well as during flight. All the legs are placed very far forward, in front of the wings, and are practically useless for purposes of locomotion. In the early stages of their life history dragon flies live in water. The eggs are laid in water, in masses, each mass enclosed in a transparent slimy covering. The larvae are very active, wingless, with a longish body and three pairs of legs, and the front of the mouth is concealed by a peculiar structure known as the 'mask.' This is a jointed structure which is a development of the lower l , and it can be thrust out suddenly to catch the insect's prey, which is then drawn up to the mouth to be devoured. There is no definite pupal or chrysalis stage. The larva moults several times, and when it is full grown it climbs up the stem of an aquatic plant, and the perfect insect begins to emerge almost immediately. Dragon-flies are usually brightly coloured.

Ephemeridae.—May-flies.—These are common in the tea districts, and are easily recognised by the delicate transparent wings which are held in a vertical plane when the insect is at rest, and by the fragile tapering body terminating in two or three long, delicate, hairlike processes. The mouth parts are either feebly-developed or absent, and the insect does not feed in the adult stage. The eggs are laid in water, and give rise to slender larvae, which have long antennoe, biting mouth parts, and usually long processes from the end of the abdomen. The larvae, are provided with peculiar projection which function as gills, and undergo a large number of moults before becoming full-grown The full-grown larva, or 'nympha,' comes to the surface, and a flying insect emerges which is known as the 'sub-imago.' This flies away and settles, and, shedding a delicate skin, gives rise to the perfect insect.

Sialidae.—An unimportant family of insects in India, not at all likely to attract the attention of the tea planter,

Panorpidae.—The scorpion-flies, though uncommon, are worthy of mention on account of their peculiar appearance, which may attract the attention of even the most casual observer. The head is prolonged into a tapering break, at the end of which is a biting mouth. There are two pairs of wings of equal size, which are held at an angle to the body, and the body of the male is long and slender, with the last joint swollen and the end joints turned up and curled over the back like the tail of a scorpion. They are predaceous, and feed on other insects. The larva lives in the soil, and feeds on decaying vegetable matter. In appearance it somewhat resembles a caterpillar. There is a distinct pupa, found also in the soil.

Hemerobiidae.—This family is composed of a miscellaneous assemblage of sub-families, having very little in common beyond a general similarity in the life-history and in the structure of the mouth parts of the larvae. It includes three forms likely to be of interest to planters in North-East India, the ant-lions (*Myrmeleoninae*), the lace-wing flies (*Chrysopinae*) and forms (*Mantispinae*) which resemble the praying mantis. The Anti-lions, in the larval stage, construct conical pits in sand, at the bottom of which they lie concealed. Small insects, such as ants, &c., fall into these pits, and are seized and devoured. These pits are common beneath the chungs of bungalows in Assam. A species of lace-wing fly, very common in the tea districts, is worthy of mention as the larva feeds on red spider, aphids, &c. The eggs of this species are to be found on the leaves of the tea bush. They are oval and milky white, and are attached to the leaves by a white slender thread. Most planters will have noticed, on the leaves of the tea bushes, a fine stiff white thread with a white knob at the end, like a tiny drumstick. The knob of the drumstick is the egg of *Chrysopa*, the lace-wing fly. From this egg emerges an active slender larva, with six long legs, a pair of long curved jaws, and the body covered with spines. This sucks the body juices from its prey, and then sticks the empty skin on to its back, where it is held by the spines. After a time the insect is almost entirely concealed by the accumulation of skins. Lace-wing larvae are very voracious, and one larva will account for an enormous number of victims. At the end of about a week, the larva forms an oval white cocoon made of silk, which is situated on the bush, and a month or so later the perfect insect emerges. The adult, which is commonly found round the bungalow lamps in the evening, has a slender green body and a pair of large transparent wings, with a greenish tinge and many veins. The wings are very large compared with the size of the insect, and when the insect is at rest they cover the body like the roof of a tent. The *Mantispinae* bear a superficial resemblance to the praying mantis in that the front pair of legs is of similar construction. They are easily distinguished, however, by the fact that the first segment of the thorax is not elongated, and by the structure of the wings. In the true mantids the front pair of wings is thickened and modified to form wing covers, while the hind pair is much large and membranous. In the *Mantispinae* both pairs of wings are membranous and transparent and of approximately equal size. The *Mantispinae* are predaceous, but whether they may be classed as benficial insects is doubtful, as the larvae feed on the eggs and young of spiders.

Phryganeidae.—Caddis-flies.—These are all aquatic in the young stages, and every one is familiar with the 'caddis worm' of Europe. They are of no importance in the tea districts.—*The Indian Tea Association, Scientific Department Quarterly Journal.*

RUBBER.

Overseas Trade in April.

RUBBER BY QUANTITY.

Imports of Rubber*	1913.	1914.	1915.
From Dutch East Indies † (Centals of 100 lbs.) ...	N. S.	N. S.	877
„ French West Africa ...	2,301	863	1,414
„ Gold Coast ...	2,641	1,168	301
„ Other Countries in Africa † ...	N. S.	N. S.	6,752
„ Peru ...	2,959	430	1,882
„ Brazil ...	46,775	34,485	34,346
„ British India † ...	N. S.	N.S.	3,885
„ Straits Settlements and Dependencies, including Labuan ...	32,062	37,197	75,568
„ Federated Malay States ...	20,582	21,982	28,702
„ Ceylon and Dependencies ...	10,947	11,639	25,382
„ Other Countries † ...	40,503	30,720	2,963
Total imports ...	158,770	138,484	182,072

Re-Exports of Rubber.*	1913.	1914.	1915.
From Russia (Centals of 100 lbs.)...	14,054	15,462	17,561
„ Germany ...	16,304	20,664	—
„ Belgium ...	4,659	2,917	—
„ France ...	10,387	10,118	17,201
„ United States of America ...	32,058	51,920	136,038
„ Other Countries ...	6,779	7,291	13,913
Total Re-Exports ...	84,241	108,372	184,713

* Prior to 1915 these figures include waste and reclaimed rubber as well as raw rubber.

† Prior to 1915 imports from the Dutch East Indies, British India, and "Other Countries in Africa" were included opposite the rubric "Other Countries."—*The India Rubber Journal.*

HINTS ON BRITISH CUTLERY EXPORTS WHICH SHOULD TAKE THE PLACE OF GERMAN GOODS.

India.—The imports of cutlery in India in the year ended March 31st, 1913, amounted in value to £149,659; of this amount the imports from the United Kingdom accounted for £69,798, while those from Germany were £58,894. The imports from the United Kingdom have gradually fallen since 1910-11 when they reached £74,124, while those from Germany have gradually increased from £44,924 in the same year.

As regards imports *via* Karachi, however, the imports from Germany fell by 29 per cent. in the year 1911-12 as compared with 1910-11. This says the Collector of Customs, seems to show that the dealers have found by experience that a cheap article soon deteriorates in the Indian climate and does not always find a ready sale. They appear accordingly to have turned their attention to better qualities, as the imports from the United Kingdom increased by 10 per cent.—*Export World and Commercial Intelligence.*

ADVERTIZING BY CINEMA.

We have received the following account from a Contributor :—

I was a priveleged guest with a few others at the B. R. V. Theatre, Bangalore, on the 14th instant, where owing to the courtesy of Mr. Leonard Thompson, Manager of Warwick Major's excellent Cinematograph show, a private exhibition was given at 8-30 p.m. of the negative film recently taken by the well-known photographer Mr. Doveton of Infantry Road, Bangalore, for the Labour Department of the U. P. A. S. I. In spite of having been warned that a negative film would be more curious than pretty, I found this was not entirely the case, the effects produced being very beautiful owing to the splendid natural backgrounds of foliage and magnificent scenery. It was certainly curious, however, to see white coolies and black Europeans.

The film makes a striking beginning with the felling of forest, a particularly large tree falling towards the spectators and sending up a cloud of leaves and dust : a view of cooly lines in a New Clearing follows with the coolies filing off along a road to Morning Muster which then takes place ; the coolies being detailed to various works marching off in different directions, some of them crossing a bridge on their way to work. Holing is represented by a man using his pitting bar, a woman then appears with a Mamoty and fills up the hole, into which a very engaging "Kooti" then plants a tea plant. A gang of tea pluckers is next seen, and a near view of one of them shows clearly the rapidity of the workers' fingers, and the skill which comes of long practice at this work. The pluckers then file off to the factory where they are seen picking out the course leaf, their baskets are then weighed and are carried up the stairs to the Withering loft of a fine Tea Factory,

The interiors are not so successful as the rest of the film owing to want of light. To overcome this difficulty, a longer exposure was tried by using the "slow movement handle" of the Cinema Camera (which is a very up to-date machine owned by the Labour Department), this, however, is intended for such subjects as the unfolding of a rose bud. Contrary to the experience and confident expectation of the Director of the Labour Department who was present while the Camera was taking the picture, no cooly could be found to work quite so slowly as all that, consequently what with the slow rate of exposure, and the rapidity with which the film has to be passed through the projector, where it would otherwise catch fire from the heat of the flame or spark used, the very reverse of the expected result has been obtained, and the action of some of the coolies is more jerky and rapid than is possible anywhere outside a Cinema show. It is hoped, whatever other part of the film is cut out, that this will remain, for it supplies the Comic element always advisable in all well regulated entertainments. One tea-roller in a good light was taken at the ordinary speed of 16 pictures to a second, and this is satisfactory in every way, another taken with the slow speed movement is more like a firework than a bit of machinery, and this will have to be cut out.

A very pretty bit of scenery shows coolies bathing after the day's work is over, and fittingly closes the part that represents the life of coolies on the tea Estate.

Having followed the business of an Estate from start to finish, the final drinking of the tea is shown in a picture of a tea party given by a lady, which is full of life. Other parts of the film, the Manager's bungalow, for instance, were spoilt : this is a pity as we were informed it was intended to

immortalize some well known figures in the Planting world. The carting of the tea down the zigzags of a remarkable ghaut would also have been extremely interesting, but these also were unfortunately fogged.

The Director of the Labour Department informed us that a film for Rubber and another for Coffee Estate life will be prepared later on. The printing of the positives has to be done in England, which means a delay, but all 3 films will be ready for exhibition before the next labour recruiting season in selected villages. Enterprize commands success, and certainly the spectators of the first negative shown, feel that success is thoroughly deserved.

ANON.

COFFEE.

Coffee has not yet caught on. Which means, the "American Grocer" remarks, that the boom in stocks, also in wheat and corn and cotton has not yet touched coffee and speculation in it is lifeless. It must not be forgotten that the world's consumption of coffee is now between 18 to 19 million bags, and the largest part of the yearly increase is due to the increased American demand. Our contemporary adds: "We do not claim the gift of prophecy but can safely affirm that the consumption of coffee in the United States will grow yearly even beyond the normal demand of increased population, because of the temperance movement which is yet in its infancy, concerning a coffee beverage. We are making no issue as between the great conflict of Wets and Drys, but can see the handwriting on the wall declaring that this will be a temperance nation. If that be so, then as a natural result coffee will move up to the leading position as the people's beverage, irrespective of all others. What is there to take its place in the entire line of table drinks. It is a stimulant without being an intoxicant. It creates no artificial appetite for spirituous liquors, and while it does stir pulse and brain to increased energy it is not at the expense of health and strength. The important query at present is that of production."

All the propaganda of the Tea Cess representatives will not deter Americans from making coffee their chief beverage. It is not therefore contended that the growth of temperance habits in the U. S. A. will not assist tea. But at present it is arguable that the tea consuming nation with the greatest potentialities is Russia. The Russian Government has demonstrated the absolute earnestness of its effort to destroy vodka, and the gap created in the drink supplies of 150 million people of growing wealth and with a rising standard of comfort gives the Indian tea industry one of the most splendid opportunities which has ever challenged the enterprise of an enterprising race. It would pay the Tea Cess Committee, re-casting its programme, to for some years concentrate its *entire* energies on Russia. A world-wide campaign has superior advantages in normal circumstances, but the Russian opportunity is unique. And the Tea Cess Committee would not stand alone in thus initiating a campaign for placing British trade with Russia on a wider basis. Steps are being taken, in which British financiers and manufacturers will take a foremost part, to reduce German trade with Russia to a minimum. In such a campaign the tea industry has as good an opportunity of "making good" as any. It is up to the Tea Cess Committee to recognise its opportunity—and grasp the fruit while it is ripe.—*Capital*.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 28.] JULY 10, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert has gone to Coimbatore to attend the College Day but will return early in the week. He supplies an article. A good suggestion is given about collecting ashes from limes. In the case of rainfall, it is interesting to know that it has been proved that it does not diminish if the forest is denuded. Streams do become irregular but rainfall apparently is unaffected. An extract on "Rubber in Malaya" is taken from the Minutes of the Annual Meeting of the Malaya Planters' Association.

From the Consular report an account of German East Africa is extracted. A table of acreage and crops under various cultivations is given.

Probably after the war the whole system of weights and measures will be taken in hand and the whole world's system brought into harmony, simplyfying commercial intercourse. The Decimal Association report that "public interest in the metric system has greatly increased."

We are indebted to the "Capital" for the continuation of Java *versus* India, and in this article Cinchona and Rubber are reviewed. There has been a marked increase in Rubber both in Java and India.

The Director of the Labour Department sends us for publication an extract from the Report of the Standing Committee of the Planters' Association of Malaya. The tables showing the growth of Immigration and the figures relating to Indian Population on Estates will be interesting to the subscribers to the Labour Department of the U. P. A.

The Director of the Labour Department has gone to Kollegal in the Coimbatore District for a few days and hopes to return early next week.

I should feel very much obliged if Honorary Secretaries would furnish lists of those members of their districts who have gone to the front or who are serving in any capacity in response to the appeal made by the Secretary. A few lists only have been received and the Secretary is anxious to have full lists ready for publication at the Annual Meeting.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Wood Ashes and Potash.

Mr. Chas. Gibbon, in the *Planting Gazette*, after pointing out the value of Potash as a Tea manure and the value of Lime, Potash, and Basic Slag in helping to make available the stores of plant food existing in the soil in an insoluble condition, makes some practical suggestions with regard to the conservation of Wood Ashes as a valuable source of Potash supply during the War while German supplies of Potash salts are cut off. He says, "On many estates the ashes from the furnaces are neglected or carelessly misused. They should be kept dry and applied with Basic Slag or Superphosphate, or Bones. *Grevillea* and *Dadap* ashes have most valuable proportions of Potash, and Lime, in their composition. Another source is the cooly lines. Give the Kanganies barrels or tins to collect dry ashes and pay from ten to twenty cents per bushel for weekly deliveries. A force of 200 coolies would contribute from their fires a handsome quantity in twelve months. Then in the low country districts ashes can be got from villagers, and collected from bazaars and small townships, but collectors must be taught to keep them dry and free from worthless admixtures. The best ashes are the lightest in colour and in weight."

Wood ashes are, of course, a valuable source of Potash and their content of this constituent varies with the material from which they are made. As a rule, Wood ashes contain about 2% of Potash, but a sample analysed in my laboratory a short time ago contained 3·9% of Potash.

Garden and Field has the following on the liberation of the stores of Potash in the soil combined in a form unavailable to plants:—

"While the supply of potash manures from Germany has been stopped by the war, and a good many users of kainit and sulphate of potash will now have to do without these fertilisers, it is well to remember, that there is a natural supply of potash in the ground which may be locked up. While they could get constant supplies of potash many farmers were content to keep adding, but the time has come to look for the magic key which unlocks the door, liberates the potash, and makes it available for crops. Our forefathers used this key for the same purpose, but perhaps without quite knowing why, years before the potash mines in Germany were opened up, and the key was a dressing of lime. If we return to it again, and this valuable essential to fertility is applied to land requiring it, the door will be unlocked and Nature's reserve of Potash be liberated in a form that crops can avail themselves of it. If this hint be taken, and we utilise other sources of potash that are available, we shall carry through until potassic salts are again available."

Forest and Rainfall.

The effect of clearing forest land on the rainfall of a district is one about which much is heard from time to time in connection with the opening up of jungle in Tea and Rubber Estates. Many arguments on both sides have been put forward, and it has often occurred that land for Tea estates has been refused on the ground that the felling of the forest will reduce the rainfall. That such clearings on a limited scale have no effect on the rainfall, but may have some effect on the run off and on the stream flow, especially at the beginning before the Tea is well established, would appear to find confirmation in what has happened near Wallace City, Idaho, U. S. A. described in the following extract from *Indian Engineering* which we have copied from the *Indian Forester*.

"An interesting case has occurred affording practical demonstration of what has long been argued in an academic way by engineers. In Idaho,

U. S., a forest fire four years ago burnt out the watershed supplying water for the city of Wallace. The stream both supplied the water for the City and operated an electric plant. Since the loss of the forest, the flow of the stream has become irregular, the minimum having fallen to 25 per cent. below the minimum formerly noted. The electric plant has also been affected by the discharge often falling below that necessary for operation, thus necessitating frequent resort to the reserve steam plant. Meanwhile rainfall observations have shown the fall continues to be normal. The case has proved that the loss of forest has not effected the rainfall, but has conduced to irregular run-off; that is, there is no longer conservation of water during a dry period and gradual discharge of it from the forest area to the stream. It will be remembered that most writers have contended that forest does increase rainfall and this case would seem to disprove it. On the other hand, no one, we think, has ever maintained that the effects are felt on a small area of forest. Whether when a very wide area of forest has been denuded rainfall diminishes remains to be proved, and we hope will be proved some day. That forest denudation affects the regularity of stream-flow has been more generally accepted as correct, and we are glad to see that in the case of the city of Wallace practical effect is to be given to the belief by re-afforesting the burnt-out area."

The case of Rubber must be different since here the native forest is quickly replaced by forest trees, *Hevea*, and the natural conditions more or less completely restored.

Rubber in Malaya.

From the *Minutes of the Annual Meeting of the Planters Association of Malaya* held at Kaula Lumpur on 25th April last, the following information regarding Rubber in this Colony is extracted.

The export of Rubber during 1914 from the F. M. S. was 30,697 tons an increase of 7,231 tons over 1913. The export from the whole Peninsular was 47,006 tons an increase of 13,365 tons over 1913. The production for 1915 is estimated at 61,800 tons.

At the end of 1906 there was approximately 100,000 acres planted with Rubber in the Peninsular, now there are approximately 670,000 acres "At present further extensions are on a much more modest scale, but they have by no means come to an end; capital raised for this purpose being, in some cases, not yet fully expended, while in others the application of profits to this end is relied on to compensate for original over-capitalisation."

In 1912, rubber, was in some instances being produced at 10*d* per lb. "Among the senior estates, this level of production has now in numerous instances been reached, but the great majority of producers at the present moment are quite unable to produce Rubber at anything like this price."

"While more scientific methods of valuing rubber have not, so far, been adopted by the buyers, some nearer approach has been made to a rough and ready standard, judged by feel and appearance. 'Standard Crepe' and 'Standard smoked Sheet' are now well understood terms, and in methods of manufacture to meet the demand for these grades there has been steady improvement. Factory administration has likewise advanced in increased cleanliness of preparation and waste saving methods. Various new methods of curing have been introduced and have met with more or less favour, but the great majority of estates, adhere to one or other of the above mentioned forms for turning out their crop."

RUDOLPH D. ANSTEAD,
Planting Expert.

GERMAN EAST AFRICA.

The following account of German East Africa is compiled from the Consular Report. (No. 5441) for the years 1912-13.

The principal ports on the coast are the capital, Dar-es-Salaam, and Tanga. At the former there are electric cranes for transferring cargo from the lighters to the custom house. The value of foreign trade, exclusive of goods in transit, increased from £3,416,470 in 1911 to £4,086,377 in 1912. *i.e.*, by 19·6 per cent. The value of the total imports amounted to £2,515,456 in 1912. The imports, *via* the coast ports show an increase of 10·7 per cent. and those *via* the overland routes, chiefly *via* the Uganda Railway and Victoria Nyanza show an increase of 1·5 per cent. The total value of the exports in 1912 was £1,570,915. This is an increase of 40 per cent. over 1911, the coast trade increasing by 46·4 per cent. and the overland trade by 19·2 per cent. The value of the direct trade with India rose from £360,000 to £440,000. Only the imports are of consequence as the total exports amounted only to £440. The chief articles of import in 1912 were cotton goods and Rice.

The whole population increased from 1866 to 5336. 15·6 per cent. of these are Government officials, 24·9 per cent. planters, and 14·1 per cent. Missionaries.

"The Indian community which has increased by some 4,000 in the last six years, is regarded with extreme dislike by the majority of the white population, and to judge by the attitude of the Indians themselves, is not invariably accorded a sympathetic treatment by the German authorities. With the exception of Goanese and Parsees (of whom there are practically none in the Protectorate) Indians are placed on the same legal footing as the natives, but they cannot be sentenced to flogging or chain-gang labour. As a matter of fact the Indian is a useful, if not an indispensible, member of the community. He is a pioneer of trade, a clever clerk, and a skilled mechanic. He carries on work which the native is incompetent to perform, and he can do so under conditions of life and with an amount of food and capital which would be utterly impossible for a European. The general contempt with which he is treated is due partly to the belief that he is the channel through which large sums which would possibly otherwise be spent in the Protectorate, flow to India, and partly to jealousy on the part of would-be German competitors."

The total native population is between 7 and 8 millions. The average density is approximately 8 to the square kilometer, excluding the area between the great lakes. The pacification of the country tends to produce a more equal distribution of population than under the old conditions of tribal warfare, but there are still districts where the inhabitants are very few; one third of the large central district of Tabora is still totally uninhabited. The ever increasing plague of the tsetse fly has denuded some districts formerly rich in cattle. It is hoped that the march of civilisation, by introducing sources of water supply, combating the tsetse, and eradicating sleeping sickness and other diseases, will so extend the inhabitable area that the population will have room for increasing manifold.

With the extension of the railways great hopes were entertained of the development of the Colony as there are still large tracts of thickly populated and fertile land which await opening up. "The planters who often lack cohesion and the ability to work together for the general good," says the

Consul in his report, "are apt to lay their misfortunes at the door of the Government in times of adversity. They complain that there are too many officials, that they are over-burdened with troublesome regulations, and that the Government does not supply them with the work people they require. The officials, on the other hand, find their districts too large, while the volume of work is continually increasing. The Government is willing to assist the planter to obtain his work people, but is well aware that the planter needs not only to be provided with hands, but often to be controlled in his bearing towards them. It is also alive to the fact that natives must be encouraged to work on their own farms as well as for Europeans."

An account of the Rubber and Coffee industries in this Colony was published in the *Chronicle*, p. 294. The following acreages and crops are given in the Report under review :—

	Acreage.	Crop.
Ceará Rubber	112,257	1,017 tons.
Other Rubber	1,010	—
Sisal	61,877	—
Cotton	35,770	—
Kapok	6,580	53 tons.
Coffee	12,007	1,575 tons.
Cacao	300	12 tons.

R. D. A.

In the recently issued report of the Decimal Association for 1914, it is stated that since the outbreak of the war, public interest in the metric system of weights and measures has greatly increased. Many of our manufacturers, however, still persist in using only British Weights and measures in their catalogues and price lists intended for abroad, instead of quoting in terms of the units in vogue in the foreign country. It is evident from the reports of our Consuls and representatives abroad that this practice has a prejudicial effect on the extension of our foreign trade, particularly in countries in which the metric system is used exclusively. That system has been legal in the United Kingdom for the last eighteen years, but comparatively little advantage has been taken of it either in internal or export trade. This is probably due to the fact that the system is not given sufficient attention in schools, and is more or less completely unknown to the majority of the trading public. The Association of Chambers of Commerce has realised that the general adoption of the metric system in this country is primarily an educational question, and has recently passed a resolution urging the Board of Education to take action in the matter. The decision of the Decimal Association to give precedence in its propaganda to the adoption of decimal coinage appears scarcely to be auspicious for the success in its metric system campaign. The decimalisation of the coinage is not an urgent matter. It will meet with strenuous opposition from interests that look with favour or at least indifference on the metric system of weights and measures, so that the idea of making such a highly controversial innovation a preliminary to the introduction of the metric system seems rather a retrograde policy.—*Nature*.

CINCHONA AND RUBBER IN JAVA.

In last week's issue we published an account of the Coffee industry in Java taken from a series of articles entitled "Java *versus* India" appearing in *Capital*. Below is an account of the Cinchona and Rubber industries in that island derived from the same source.

"*Cinchona.*—The exports from Java of the Jesuits bark have been always an important item of her trade and now represent about ⅓rds of the world's supply. Up to 1895 and 1896 the entire quantity was sent out in bark which was sold at Amsterdam by public auctions. Germany was one of its largest purchasers, but the great manufacturing firms soon found it convenient to form a ring in order to keep the price of the raw material at a low level. This had a very serious effect upon Java and made all her plantations of cinchona, carried on either by Government or private agency, almost unremunerative. On finding their position thus threatened, the Dutch Government were obliged to adopt measures with a view to counter balance this adverse influence, and one of the early steps taken was to establish local factories for the manufacture of quinine on the lines laid down in British India. The United Kingdom, which cannot under the avowed policy of the Indian Government obtain any benefit from the large stocks of bark and quinine held up at Darjeeling and Ootacamund, are now the largest purchasers of Java quinine. The total exports of quinine and cinchona bark from Java during 1910 were 1,533,200 ozs. and 20,427,328 lbs. respectively. During the next year quinine showed an increase to about 2,665,200 lbs., while under bark there was a slight decline, the quantity sent out being 19,048,708 lbs. The factory at Banetaeng in the Preanger Regencies appears to have obtained very successful results, and its quinine finds a ready sale for its whole output at 5⅝ to 6¼*d.* per oz. The average price of the bark in 1911 was 3·166c, which is a shade lower than that of 1910. In 1912 the total shipments of bark to Europe amounted to 19,168,517 lbs., for which the average price per unit at the Amsterdam auctions was 3·29c. against that recorded of the previous year. Quinine also improved to 6⅝ to 10⅜*d.* per oz. This factory now has begun the manufacture of sugar-coated and uncoated sulphate of quinine tablets of 3, 5 and 6 grains which are largely consumed locally. A thriving trade in this article is also carried on with the Straits Settlements, the Federated Malay States and also British India. The quantity exported during 1912 amounting to 675,000 lbs.

"Be it recorded to the credit of the Indian Government that in spite of the prospects of this business, it has still continued to place the entire output of its plantations for the benefit of its malaria-stricken people at cost price throughout all the mofussil district."

"*Rubber.*—It is only from 1911 that we find any records of Java transactions in rubber where the plantations have lately been reported to have reached the productive stage. But the larger plantations have not yielded any appreciable results as yet and her exports contain a very large proportion of wild rubber collected from neighbouring hills. It is believed that Java will soon be able to produce a fair quantity of rubber. But it is curiously remarkable to observe here also the repetition of the Indian selection of the species suitable for cultivation. As in Assam and Burma, the trees generally preferred are those of *Ficus elastica* and *Hevea brasiliensis*. Very little of the *Castilloa* rubber that has found favour in South India and Ceylon is grown in Java. In 1910, the exports were only 156,700

lbs., which in the following year rose to 978,600 lbs. But in 1912 we find them suddenly expanded to 2,233,117 lbs., which represents an increase of over 140 per cent.

"In British India the development of our trade in raw rubber also shows marked signs of expansion. In 1909-10, the total exports were only 1,611 cwts., in 1912-13, they were 14,627 cwts., while last year they came up to 23,264 cwts. Our most important rubber area is of course the Charduar Plantations in Assam, now under the management of the Forest Department, where propagation is confined to *Ficus elastica*, which may aptly be termed the true India rubber tree. This tree, has for years and years, become acclimatised to the climate and the soil of Assam and Bengal. Burma also produces very fair qualities of the Pará rubber, and the latest reports show that a persistent policy of improvement of the plantations and their yield is being introduced throughout the province. There has also been a slight improvement in the quality of the Ceará rubber (*Castilloa elastica*) produced in South India, but not sufficient to induce the marked rise in prices except as such may be accounted for by the large demand for this product all over the world."

Russia.

The following information is from the report by H. M. Consul at Batoum (Mr. P. Stevens) on the trade of that District in 1914, which will shortly be issued :—

Tea Cultivation in Batoum District.—Progress in tea growing in the environs of Batoum, although not very rapid, continues and the results are promising. The Imperial domains annually increase their area under tea by about 50 acres, and private enterprise in the cultivation of tea is steadily becoming more general. The cultivation of tea away from the Coast, in the district of Ozurgeti was also marked with some success in 1914. The peasantry were encouraged to take up the cultivation of tea alongside that of maize. There seems no reason to doubt that, with the rich soil, favourable climatic conditions, and fairly plentiful cheap labour that farmers possess in interesting their women and children to work in their tea fields, the improvement and development of the industry will become more marked in the near future.

The tea bush was healthy throughout the past year, and the 1914 crop of tea is reported to have been good and abundant. The yield of leaf for the year by the tea plantations near Batoum is estimated at about 360,000 lbs. No figures, however, of the actual production are yet obtainable, —*Board of Trade Journal.*

Federated Malay States.

Rubber Exports during May, 1915.—The following figures of the exports of cultivated rubber from the Federated Malay States during the month and five months ended 31st May, 1915, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for 1914 being added for purposes of comparison :—

	1914. Tons.	1915. Tons.
May	2,069	2,708
January—May	11,544	15,787

—*Board of Trade Journal.*

LABOUR DEPARTMENT.

The following is an extract from the Report of the Standing Committee of the Planters' Association of Malaya, presented at the Eighth Annual Meeting held on the 25th April, 1915 :—

LABOUR.

The whole area represented by this Association is included in the activities of the Indian Immigration Committee, consisting of 3 official and 6 unofficial members, under the chairmanship of the head of the Straits Settlements and F. M. S. combined Labour Department.

This Committee administers a fund raised by assessment from all employers of South Indian labour and pays the cost of transport and other expenses incidental to the recruiting of all immigrants from South India recruited on the Committee's licenses. These are almost entirely, Estate labourers. Other employers, including the Government (which recognises the situation to the extent of paying a subsidy to the steamship line), rely upon the Estates in the first instance to import all the Tamil labour employed in the country.

The following statistics, supplied by the Committee, show the growth of immigration from South Indian Ports for ten years :—

	Arrivals.	Departures.	Nett Gains.
1905 ...	39,539	19,754	19,785
1906 ...	52,041	21,879	30,162
1907 ...	62,274	30,522	31,752
1908 ...	54,522	30,920	23,602
1909 ...	49,817	31,374	18,443
1910 ...	83,723	39,080	44,643
1911 ...	108,471	48,103	60,368
1912 ...	106,928	63,885	43,043
1913 ...	118,583	70,090	48,493
1914 ...	51,217	63,073	—11,856

These figures include all Tamil immigrants and emigrants, not only those known to be recruited direct for Estate work.

It will be seen that for the first time during the ten years period a nett loss has to be recorded : the recruiting season having been abruptly interfered with by the suspension of immigration from the date of the outbreak of war until 18th January, of this year.

(Labourers return to India from Malaya in numbers from October to February, normally a return flow sets in after March, so that the outbreak of the war interfered with the 2 months August and September. Coolies are not expected till the following March. The Emigration business was re-opened in January, 1915, assisted passages being limited to fortnightly Mail Steamers from Madras and Negapatam. A. Ff. M.)

The great drop in employment on rubber Estates due to thinning out and increase in tappers' tasks, to reduced demands for weeding, as young clearings approach maturity, and to the pause in the policy of extending, have contributed to prevent this falling off in immigration proving a disaster. At present there is a slight stringency in the supply of Tamil

labour, with some resulting inconvenience in certain districts, but, as sailings have now been resumed, there is little likelihood of serious shortage unless it should prove that the temporary check to the stream of immigrants has diverted it elsewhere.

(The insinuation in the "Straits Times" of 20th April, that the lowering of rates of pay and increasing the tasks affected the position, was denied at the Meeting, A. Ff. M.)

The Estate Indian labour population in the F. M. S. is estimated at the end of 1914 to have amounted to 120,000 out of the total Estate labour population of 160,000. The balance of 40,000 is made up of 24,000 Chinese, 10,000 Javanese and 6,000 Malays and others.

The employment of Chinese has remained stationary, even in Negri Sembilan where 46% of the whole labour employed is Chinese. The numbers of Javanese have decreased by 7% during the year. Of Indians 20,500 less were employed on Estates at the end of 1914, as compared with the beginning, of which decrease the Selangor coast districts have contributed nearly 10,000.

For the Colony, the following figures relating to Indian population on Estates is available,

		1st January, 1914.	31st December, 1914.
Singapore	...	942	676
Penang	...	219	178
Province Wellesley	...	8,562	8,609
Dindings	...	1,056	1,167
Malacca	...	6,395	6,652
		17,174	17,282

It is interesting to record the publication at Madras (in Tamil and English) of a pamphlet entitled "The Indian Coolie in British Malaya" by Mr. Rai. This represents the report of an independent enquiry into the conditions of Tamil labour in this country conducted by a well qualified Brahmin gentleman, resident in Kuala Lumpur. While containing valuable criticisms, his general conclusions afford a satisfactory reply to various calumnies, to which publicity has been given in certain sections of the vernacular press of Southern India during recent years.

Wages.—A combined effort has been made in districts where an excessive demand for labour had recently raised the rate of wages unduly, to bring down rates to a normal level. This has met with a large measure of success, particularly in regard to Chinese labour. For time work Chinese are now practically nowhere paid more than 50 to 55 cents per day: Javanese or Malays more than 40 to 45 cents: or Tamils more than 40 cents. Throughout the districts where Tamils are chiefly employed the average rate is 30 cents. Everywhere as the Rubber industry settles down on more normal lines a tendency is noticeable to substitute piece work, in some form or another, for time work. There is no reason why rates should ever again rise to the excessive levels of recent years and the policy of the Association is to keep the cost of labour within reasonable limits.

AYLMER FF. MARTIN,
Director.

Bangalore, 1st July, 1915.

SCIENTIFIC DEPARTMENT, U P. A. S. I.

Scale of Fees for analysis in the Bangalore Laboratory.

A.—SOILS.

		Rs.
1.	Complete Chemical Analysis, including the available Potash and Phosphoric Acid	...40
2.	Mechanical Analysis	...10
3.	Complete Chemical and Mechanical Analysis ...	...50
4.	Calcium carbonate and oxide content	...10

B.—FERTILISERS.

1.	Potash in Potassic Fertilisers	6
2.	Phosphoric acid, total and citrate soluble, in Phosphatic Fertilisers	8
3.	Organic Matter, Insoluble Matter, and Nitrogen in Poonacs, &c.	6
4.	Organic Matter, Insoluble Matter, Nitrogen, and Phosphoric acid in Bones, Fish, &c.	8
5.	Complete Analysis of Fertilisers such as Composts, Cattle manures, &c.	...20
6.	Complete Analysis of Lime, Limestones, and Slaked Lime ...	...10

Half the above rates will be charged to all Members of District Planters' Associations.

For methods of taking samples of Soils and Fertilisers and the quantities to send for analysis see *Planters' Chronicle* Volume X pages 207 and 216.

All samples for analysis should be sent plainly labelled to "The Planting Expert, 25, South Parade, Bangalore," and should be accompanied by a covering letter giving full information about the sample and the analysis desired according to the above table. Fees should be remitted to "The Secretary of the United Planters' Association of South India, 25, South Parade, Bangalore."

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 29.] JULY 17, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department provides us with an article on "Coconut Poonac" and its analysis and that of Hongay Poonac is given. Also a useful tip for the protection of horses and cattle from flies and ticks is copied from the *Journal of the Royal Society of Arts.*

The proceedings of four District Planters' Associations are published this week. We note that the West Coast Planters' Association will be represented at the forthcoming Annual Meeting by Messrs. Waddington and Morrell. We would especially draw attention to the fact that out of the 42 members of this Association, no less than 24 have joined the Army, and we hope in our next issue to publish not only their names but those of others from other Districts who are serving the Empire. We regret that our lists are still incomplete. A good response was made to an appeal for subscriptions to the S. I. P. B. Fund. The Bababudin Planters' Association proceedings are more of local interest, but we note that Messrs. Boyd and Dennis will represent them at the Annual Meeting. The Shevaroy Planters' Association paid a last and feeling tribute to the memory of the late Mr. F. D. Short, one of the oldest members of their Association. Mr. Turner, will represent this Association at the Annual Meeting.

The Rubber Growers' Association, at the suggestion of the Statistical Committee of that Association have decided to compile and issue monthly Rubber statistics of general interest to the trade and a copy each month will be sent to this office, which will be published in this paper.

The Manager of Chickanhully Estate, Belur, P. O. Hassan District wishes it to be stated that the Soil Analysis in Circular No. 17 issued by the Assistant Scientific Officer for Mysore, does not refer to his Estate but to another Chickanhully Estate in South Mysore.

A temperate but strongly worked letter from the Madras Chamber of Commerce to the Government of India on the internment of all male alien enemies has been received in the office which when read, by the permission of that body, at the Annual Meeting, will, we are confident, receive the unanimous and cordial support of the U. P. A.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Coconut Poonac.

Coconut cake is as a rule used for cattle feeding purposes, but lately owing to the War and other reasons the price has been so low, Rs.12-14 per ton, that it is possible to consider it as a fertiliser. A sample sent me from the West Coast has recently been analysed in the Bangalore laboratory with the result given below. It will be seen that it approximates to Hongay Poonac as a fertiliser. It is rather oily and very sweet so that when applied it should be buried or there may be danger of rats, &c., being attracted by it.

The analysis of Hongay Poonac quoted below for purpose of comparison, was given recently by Dr. Harrison, the Government Agricultural Chemist, as representing the average composition of this Poonac is South India.

	Coconut Poonac.	Hongay Poonac.
Moisture	12·89	
*Organic matter	78·09	
Phosphoric Acid	1·47	0·6
Potash	1·89	0 6
Other soluble mineral matter	3.05	
Insoluble mineral matter	2·61	
	100·00	...
*Containing Nitrogen...	3.50	3·90

Protection of Horses and Cattle from Flies and Ticks.

The following useful tip is copied from the *Journal of the Royal Society of Arts*:—

"A French journal, *L'Agriculture Nouvelle*, gives an account of some experiments made by M. Lang, a veterinary surgeon in the French Colonial Service at Noumea (New Caledonia), for the extermination of a species of horse-fly which infested the animals under his charge. This insect, which appears to be very tenacious of life and difficult to kill, is only driven away for a short time by applications of coconut oil, oil of juniper berries, and petroleum, and quickly returns to resume its attacks. Wounds or sores are very difficult to heal on this account as the insect is a carrier of contagion.

"The remedy which is simple and is said to be effective, consists merely in anointing those parts of the body of the animal infested with these pests with cod-liver oil. The flies are killed immediately by contact with the oil. No caustic effect to the skin of the animal is produced by this oil as is the case with other fish oils.

"The application of cod-liver oil is equally efficacious for the extermination of the common house-fly as well as the mosquito. Ticks which infest dogs, sheep, and other animals, can be readily destroyed by an application of cod-liver oil. The effect of these applications lasts from ten to eighteen hours.

"Spread on the surface of pools of water this oil has the effect of killing immediately the larvae of the mosquito."

RUDOLPH D. ANSTEAD, *Planting Expert.*

DISTRICT PLANTERS' ASSOCIATIONS.

West Coast Planters' Association.

Proceedings of a Extraordinary General Meeting held at Malabar Club, Calicut, on 3rd July, to consider the programme as to starting of Experimental Stations by the Scientific Department of the U. P. A. S. I,

PRESENT.—Malayalam R. & T. Co., per Mr. A. C. Morrell, (Chairman,) Pudukaad Rubber Co., per Mr. H. Herklots, MoplyValley Rubber Co., per Mr. E. H. Halliley, Moply Valley Rubber Co., per Mr. E. L. McLean, Moply Valley Rubber Co., per Mr. A. H. Mead, (*by proxy*), Mysore Rubber Syndicate. per Mr. Guyver, Kerala Rubber Co., per Mr. Campbell Hunt, Pullangode Rubber Estate, per Mr. H. Waddington; (Honorary Secretary), and Mr. J. Christie. *Visitors.*—Messrs. Lescher, Whitton, DeCoursey, and A. H. Robb.

222. *Scientific Department, U. P. A. S. I. Experimental Stations.*—The Honorary Secretary read correspondence between himself and Messrs. Richardson, Browne and the Hon'ble Mr. E. F. Barber and the Combined Travancore Planters' Association and a telegram from Mr. B. Malcolm, Manager of the Eddivanna Rubber and Tea Company regreting his inability to be present and hoping the meeting " will recommend moderation of Scientific Department Scheme personally think scheme as at present suggested unnecessarily large." After a discussion lasting some time, the meeting finally came to decision :—

Members present are doubtful of the necessity of two Experimental Stations for Rubber, but think that a station situated where there is old rubber, which has been tapped for some time and in a District where second Leaf Fall is common would suffice and it appears to them that Palapilly District of Cochin meets these requirements. But if decision of the U. P. A. S. I. is that two Experimental Stations are necessary, then they think they should be situated as suggested by Committee of the Scientific Department.

With a vote of thanks to the Chair the meeting terminated.

(Signed) A. C. MORRELL,
Chairman.

(„) H. WADDINGTON,
Honorary Secretary.

WEST COAST PLANTERS' ASSOCIATION.

Proceedings of a General Meeting held at Malabar Club, Calicut, on the 4th July, 1915.

PRESENT.—Messrs. Guyver, Halliley, Herklots, Hunt, Mead, (*By Proxy*), Morrell, MacLean and Waddington representing Estates as above and Mr. W. O. Wright. *Visitors.*—Messrs. Hadow, Lescher and Robb.

The Proceedings of the last meeting were confirmed.

223. *Accounts.*—A statement of Accounts to 30th June, were laid on the table with estimated budget for next six months, showing a probable balance of Rs.750 at 31st December next.

224. *Subscriptions.*—The Honorary Secretary informed Meeting that the arrears of subscription as shown in last Balance Sheet have now been remitted but that subscription for this year have come in slowly and many are in arrears, and asked Members to pay up as soon as possible. He explained why he had made a small refund to the Eddivanna Company. His action was approved.

225. *Southern Indian Planters' Benevolent Fund.*—The Honorary Secretary reported, that as might have been expected, at the present time, with so many calls on charity for different War Funds, the support of this Fund had been much less general than in previous years, so far only four members having subscribed and appealed to members not to overlook our own special Benevolent Fund.

Rs. 470 was promised by members present.

226. *Rubber Growers' Association and Research Fund.*—Proposed by Mr. Halliley and seconded by Mr. Herklots :—

That in event of a branch of the Rubber Growers' Association being formed in Southern India, the members of this Association obtain the support of their Agents to same.—*Carried.*

Proposed by Mr. Herklots and seconded by Mr. Halliley,

That a Committee consisting of Messrs. A. H. Mead and Campbell Hunt, be appointed to enquire into the matter of Rubber Growers' Association and Research Fund and report to the Honorary Secretary who shall inform members.—*Carried unanimously.*

227. *Combined Travancore Planters' Association.*—Copies of Rules of this Association received from the Secretary were laid on the table.

228. *Scientific Department, U. P. A. S. I., Committee.*—With reference to Minute No. 216 of the last meeting, the Honorary Secretary reported that the Committee now consists of Messrs. C. H. Browne, J. A. Richardson and the Hon'ble Mr. E. F. Barber.

229. *U. P. A. S. I. Conference.*—The Honorary Secretary reported that the meeting is fixed to commence on 16th August and usual Exhibition to open on 17th Idem.

230. *Delegates.*—Messrs. Waddington and Morrell were elected as Delegates to the Conference and in the event of either being unable to go, Mr. Campbell Hunt, will take his place. The Honorary Secretary was instructed to pay Delegates Rs. 150 each towards expenses.

231. *Cochin Harbour.*—Delegates were instructed to support any action the U. P. A. S. I. may take in favour of Government Scheme as regards this.

232. *Scientific Department.*—Delegates were instructed to act on decision arrived at at yesterday's meeting which was confirmed,

233. *Railways.*--Delegates were instructed to strongly supported any scheme for a Railway through Planting Districts from Coorg or Mysore through Malabar to Cochin.

234. *War Service.*—Read letter from the Secretary, U. P. A. S. I. asking for information as to members of this Association who have left to serve their country. 24 of the 42 members on the Roll of the Association last August have since joined the Army. The Honorary Secretary was instructed to send in their names and units to which they are attached, as far known, to the Secretary, U. P. A. S. I.

With a vote of thanks to Malabar Club for loan of their room and to the Chairman, the proceedings terminated.

(Signed) A. C. MORRELL,
Chairman.

(„) H. WADDINGTON,
Honorary Secretary.

Bababudin Planters' Association.

Proceedings of a Quarterly General Meeting held at Santaveri, on Wednesday, July 7th, 1915.

PRESENT.—Messrs A. B. Boyd, (President), A. C. W. Denne, H. Kerr, N. C. B. Kirwan, F.D. Meppen, C. Sylk, S. J. Wilson and S. H. Dennis, (Honorary Secretary.)

The minutes of the last meeting were taken as read and confirmed.

SCIENTIFIC DEPARTMENT.—The new scheme for the proposed development of this Department was fully discussed by the meeting and the following decision was come to :— "That this Association considers that at the present time, it does not see its way to asking for outside contributions."

COUNCIL OF MYSORE PLANTERS' ASSOCIATION.—Two resolutions, which were carried at the meeting of the Council of Mysore Planters' Associations, held at Mudigere on April 18th, 1915, with reference to the control of the Assistant Scientific Officer, were placed before the meeting and the following resolution, proposed by Mr. Boyd and seconded by Mr. Denne, was carried :—

> "That this Association agrees with the proposal of the South Mysore "Planters' Association, that the Assistant Scientific Officer, be "placed under the control of a Committee, composed of three "members, one being appointed by each Association."

SANTAVERI DISPENSARY.—Read letter from the Special Revenue Officer, M. I. S. Kadur and Hassan Districts, Chickmagalur, General No. 998

dated 17th April, 1915. The following resolution proposed by Mr. Kerr and seconded by Mr. Wilson was carried unanimously :—

"That the Honorary Secretary be asked to inform the Special "Revenue Officer, M. I. S., Kadur and Hassan Districts, in "reply to his letter that if this Association was prepared to erect "Buildings, pay the Sub-Assistant Surgeon and the Com- "pounders' Salaries, they would not have applied to Govern- "ment for a Government Dispensary. This Dispensary is asked "for, as much for the benefit of the Government villages, and "Estates owned by Native planters, which are of a large area as "for the benefit of the Members of this Association."

COFFEE STEALING.—A case of coffee stealing which Mr. Denne had was discussed, and the following resolution for forwarding to the Mysore Government, through the Deputy Commissioner, Kadur District, was proposed by Mr. Denne and seconded by Mr. Boyd and carried :—

"That this Association calls the attention of the Mysore Government "to the absurd sentence passed by the second class Amildar- "Magistrate of Tarekere Taluq, in the Santaveri Coffee Steal- "ing case, a fine of only Rs. 10, being more calculated to "encourage coffee stealing, than to prevent it and further, would "point out that the case took 9 weeks after many adjournments, "the Association further expresses the hope that serious cases "of this nature, may in future be tried by a 1st class "Magistrate,"

ELECTION OF DELEGATES TO THE U. P. A. S. I. ANNUAL MEETING.—Proposed by Mr. Denne and seconded by Mr. Kirwan, that Messrs. Boyd and Dennis represent the Association. The Revised Draft Agenda Paper was gone through and Delegates received their instructions.

SANDERSON MEMORIAL WARD.—In 1913, subscriptions were collected from the Members of this Association to build a store room for the Ward but nothing seems to have been done in the matter, the following resolution proposed by Mr. Boyd and seconded by Mr. Kirwan was carried :—

"That the Hon. Secretary be asked to write to the Deputy Com- "missioner of Kadur District, and enquire why our subscriptions "to the Sanderson Memorial Ward have not been utilised.

RAILWAYS IN PLANTING DISTRICTS.—A letter from the Hon'ble Mr. E. F. Barber, dated June 15th, 1915, on this subject was read to the meeting.

PPOPOSED LABOUR RULES.—A letter from the Honorary Secretary, North Mysore Planters' Association, dated June 26th, 1915, enclosing a draft of the proposed Labour Rules was on the table, these with two exceptions met with no opposition.

The meeting closed with a vote of thanks to the Chairman for presiding.

(Signed) A. B. BOYD,
Chairman,

(„) S. H. DENNIS,
Honorary Secretary.

Shevaroy Planters' Association.

Proceedings of a quarterly General Meeting of the Shevaroy Planters' Association held at Yercaud, Victoria Rooms ,on Thursday, 8th July, 1915.

PRESENT.—Revd. Father Capelle, Messrs. V. Travers-Drapes, R. A. Gilby, W. I. Lechler, J. C. Large, K. Leeming, C. Rahm, W. Rahm, G. Turner and Mr. C. Dickins, (Honorary Secretary). Mrs. F. Campbell by her proxy Mr. R. A. Gilby. *Visitor.*—Mr. H. S. Dyer.

1. The notice calling the meeting was taken as read.

2. THE LATE MR. F. D. SHORT.—Mr. W. I. Lechler addressed the meeting in the following words.

Gentlemen,—I have been asked to say a few words before commencing proceedings to express the loss this Association has sustained by the death of Mr. F. D. Short. Having known him from boyhood, I can speak from personal experience and I am sure I am voicing the opinion of all present when I say he was of a most unassuming, kindhearted nature, ever ready to aid every good object to the best of his ability, endeavouring to fulfil his duties as a loyal citizen and a true Christian. He was one of the earliest members of this Association, taking an active part in its deliberations and proceedings. We have lost in him an able adviser and fellow worker and one whom it will be difficult to replace. I propose the following resolution :—

"That the members of this Association desire to put on record an "expression of the great loss they have sustained by the lamented "death of Mr. F. D. Short and tender their sincere and heartfelt "sympathy to the widow and family in their berevement."

The resolution was unanimously carried all standing.

3. The proceedings of the last Committee Meeting were confirmed.

4. BEES AND COFFEE POLLINATION.—Read and recorded letter No. 502 dated 8th June from the Planting Expert.

5. CHANGES OF POSTAL SERVICE TO NAGALUR, P. O.—Read and recorded letter dated 25th June from Post Master General, Madras.

6. MEMBERS OF THE CRIMINAL SETTLEMENT.—Read letter No. 1577 dated 17th June, from the Superintendent of Police, Salem District. The Honorary Secretary was instructed to thank Mr. G. W. Lame, Superintendent of Police for his letter, at the same time informing him that no Members of the Criminal Settlement are likely to be employed on Shevaroy Estates.

7. U. P. A. S. I. EXHIBITION.—Read Circular No. 4/15 of 10th May from the Secretary, U. P. A. S. I. relating to the usual exhibition and that exhibits should reach the office not later than 1st August.

8. U. P. A. S. I. ANNUAL MEETING AT BANGALORE.—Mr. G. Turner having kindly consented to represent the Association at the meeting, and his expense decided upon; the U. P. A. S. I. Agenda Paper was discussed and he was advised how to act with reference to each item on the Agenda Paper.

9. SCIENTIFIC DEPARTMENT.—The meeting was unanimous in thinking that Government should have the running of the above Department.

10. AUDIT OF ASSOCIATION ACCOUNTS.—Proposed by Mr. W. Rahm and seconded by Mr. R. A. Gilby.

"That Messrs. G. Turner and C. Rahm audit the Association Accounts "before the Annual General Meeting."—*Carried unanimously.*

(Signed) CHAS. DICKINS.
Honorary Secretary

RUBBER TRADE ASSOCIATION OF LONDON.

MONTHLY STATISTICS,

MAY, 1915.

IMPORTS of all kinds of Rubber into the United Kingdom.

From	April. 1915.	April. 1914.*	April. 1913.*	Four Months ended April. 1915	Four Months ended April. 1914.*	Four Months ended April. 1913*
Straits Settlements and Federated Malay States ...	4,665	2,642	2,451	17,159	10,557	8,065
Ceylon ...	1,133	520	489	6,614	2,655	2,083
British India ...	173	—	—	692	—	—
Dutch East Indies ...	39	—	—	713	—	—
Brazil and Peru ...	1,617	1,558	2,220	5,098	6,631	8,265
Africa ...	377	91	221	1,147	310	951
Other Countries ...	132	1,370	1,808	641	5,751	6,242
Total Tons ...	8,126	6,181	7,089	32,064	25,904	25,606

EXPORTS of all kinds of Rubber from the United Kingdom.

To	April. 1915.	April. 1914.*	April. 1913.*	Four Months ended April. 1915.	Four Months ended April. 1914.*	Four Months ended April. 1913.*
Russia ...	784	690	627	2,200	2,570	2,388
Germany ...	—	923	728	—	3,345	3,607
Belgium ...	—	130	208	—	842	669
France ...	768	452	464	2,078	2,207	1,550
United States ...	6,073	2,318	1,431	14,688	8,381	5,188
Other Countries ...	621	325	302	2,862	1,428	1,179
Total Tons...	8,246	4,838	3,760	21,828	18,773	14,581

* Including Waste and Reclaimed Rubber.

IMPORTS, DELIVERIES AND STOCKS in London and Liverpool, April, 1915.

		Imports,	Deliveries.	Stocks 30th April. 1915.	Stocks 30th April. 1914	Stocks 30th April. 1913.
London	Plantation ...	5,826	5,709	6,994	3.580	3,192
	Other kinds ...	58	63	585	644	979
	Total Tons ...	5,884	5,772	7,579	4,224	4,171
Liverpool	Para ...	762	836	1,104	962	1,213
	Other kinds ...	430	410	355	1,136	1,309
	Total Tons ...	1,192	1,246	1,459	2,098	2,522
Total Tons for London & Liverpool ...		7,076	7,018	9,038	6,322	6,693

SHIPMENTS FROM STRAITS SETTLEMENTS AND F. M. S,

	March,			Three Months ended March,		
	1915.	1914.	1913.	1915.	1914.	1913.
Tons ...	5,895	3,703	2,635	18,096	11,493	8,050

SHIPMENTS FROM CEYLON,

To	March.*	Three Months ended March. 1915.	1914.	1913.	1912.
United Kingdom ...	1,255				
Russia ...	40				
Germany ...	—				
Belgium ...	—				
France ...	21				
U, S. A. ...	706	4,955	3,473	2,306	1,388
Other Countries ...	103				
Total Tons...	2,125				

* Figures made up to March 29th.

U. S. A. IMPORTS AND EXPORTS.

	February.			Two Months ended Feb.		
IMPORTS.	1915.	1914.	1913.	1915.	1914.	1913.
India rubber ...	6,910	4,573	4,697	10,464	8,206	10,284
Gutta and Balata ...	1,329	680	1,595	2,450	1,480	4,736
Total Tons...	8,239	5,253	6,292	12,214	9,686	15,020
EXPORTS.						
India rubber ...	334	207	202	561	297	427
Gutta and Balata ...	50	14	8	129	14	24
Total Tons...	384	221	210	690	311	451

PARA RECEIPTS.

	April, 1915.	Jan./Mar., 1915.	July/Dec., 1914.	Total.
Rubber ...	1,870	10,930	12,743	25,543
Caucho Ball ...	650	2,440	1,552	4,642
	April, 1914.	Jan./Mar., 1914.	July/Dec., 1913.	
Rubber ...	2,190	11,120	14,630	27,940
Caucho Ball ...	970	3,060	1,760	5,790

	April, 1915.
Shipments to Europe ...	1,320 tons
,, U. S. A. ...	350 ,,
	1,670 ,,

RUBBER.

Wild Rubber and Selection.

Dr. Cramer of Buitenzorg, in a paper under this title, gives some useful hints to growers on the selection of *Hevea*. This subject, he points out, has been neglected, or at any rate undertaken on wrong lines. The selection of *Hevea* should commence with the seed-bearers, and not be entirely confined to the seeds or the seedlings. According to the author's personal observations of both wild and cultivated trees, considerable variation occurs in the shape and size of the seeds from different examples, and also in the productiveness of wild trees, among which "barren" individuals are sometime found. Dr. Cramer gives reproductions of photographs of a series of seeds from trees of *H. brasiliensis* growing in the same localities in Brazil, which show striking variation in size. The impossibility of determining critical species from seeds alone is evident from the author's remark that "the difference in [seed] characters in *Hevea Randiana* (a closely allied species) and *H. brasiliensis* is less marked than may occur between the seeds of two trees of true *brasiliensis*.

The wild trees observed by Dr. Cramer were all from the lower reaches of Brazilian rivers, which often overflow their banks at high tide, and he suggests an interesting explanation of the cause of marked differences which are shown in adjacent trees in such localities. Frequently seeds may be observed floating down the rivers from the upper reaches, and these become stranded in quiet corners of the banks, where they form a layer on the water. At high tide they are immediately transferred to a considerable distance on the adjoining banks, where they germinate. Therefore, many of the trees now growing in the lower reaches of Brazilian rivers are really the direct offspring of upper region types, and thus a mixture of the two races has been brought about.

Part 5 of the paper deals with experiments on seedlings and tables and photographs are given showing their relative variation from different stocks.

In part 6, Dr. Cramer points out that according to the late Dr. Huber, the Tapajoz region of Brazil where Wickham obtained his seeds is not the place from which the best rubber is at present obtained and as nearly the whole of the East India Plantations have been stocked from seeds gathered in this region, it is therefore assumed that the quality of the rubber is not so good as it might have been had the first seeds been gathered in the Acré District of the up-river regions, *i.e.*, on the Beni and other tributaries of the Upper Madeira and Purús rivers, where the best rubber is at present obtained. There is, however, no indication that this rubber is superior to that which used formerly to be collected in the Tapajoz region.

The question is discussed as to whether this Acré or up-river *Hevea* may be a distinct variety or subspecies of *H. brasiliensis* as is the general belief in Brazil, and Dr. Cramer is himself inclined to this opinion.

It should be noted that Dr. Cramer's work on *Hevea* selection so far concerns the character of the seedlings only, and it remains to be seen whether the young plants showing the most vigorous growth will prove to give the greatest yield of latex.

Dr. Cramer's interesting contribution concludes with notes on the practical importance of careful choice of the best producing varieties of other agricultural crops, citing as examples the advantages which have accrued from the introduction of *Cinchona Ledgeriana* with a bark richer in quinine than the older *C. Officinalis*, the replacement by Assam instead of the old China tea, and the revival of the coffee cultivation in Java by the advent of *Coffea robusta*.—*Royal Botanic Gardens, Kew.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 30.] JULY 24, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert contributes an article on "Coffee Borer." The Editor shares with him the regret he expresses that no response has been made to his invitation to planters to send in their opinions and experiences. He believes the best preventative is white-washing the stems and gives three formulae. The Editor remembers an old Planter friend who spent most of his time plugging the exits of Borer holes with matches. Rather like shutting the stable door when the horse has been stolen.

We publish the Proceedings of the Nilgiri Planters' Association who have elected Messrs. Nicolls and Dandison as Delegates. Also the Proceedings of the Central Travancore Association and note that Messrs. Westaway, Bisset and Winterbotham (or two of the three) will represent them.

We publish a second instalment of the monthly Statistics kindly forwarded to us by the Rubber Growers' Association.

We regret that we are unable to publish a full and complete list of those members of District Associations who are serving the Empire at the Front or in the Indian Reserve of Officers, but hope that we shall be furnished with them by the remaining District Associations who have not yet sent them in.

The Director of the Labour Department has asked us to insert the following which we have much pleasure in doing:—

> "The Director of the Labour Department is indebted to the kind offices of the Ceylon Labour Commissioner and through him to the Manager of the Kattukele Division of the Talaawakelle Estate, Ceylon, for the recovery of the sum of Rs.63 (sixty-three) due by a defaulter to an estate subscribing to the Labour Department."

The Proceedings of the South Mysore Planters' Association have arrived too late to publish in this issue: but we note that they have passed the following Resolution: "That this Association is strongly of opinion that all Alien Enemies especially Missionaries should be interned and views with grave concern the presence of a number of Alien Enemies in the employ of the Mysore Government."

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Coffee Borer.

With reference to the correspondence which appeared a few weeks ago in these pages on this subject, I regret to find that no planters have responded to my invitation to send in their opinions and experiences. As stated in my letter, I believe the best preventative measure to be the white washing of the stems of the bushes, especially if they are first scraped. Tea planters often clean the stems of the bushes at pruning time to get rid of moss, lichens, &c., primarily, and I would refer to a Note on this subject published in the *Chronicle* Vol. IX. p. 4 which will be of interest to all Coffee planters troubled with Borer.

The following formulae of good white washes will possibly be found of use:—

1. 7 lbs. Washing Soda crystals.
   2 lbs. Quick Lime.
   10 gallons water.

Washing Soda costs Rs. 6-8-0 per cwt; good quick lime Rs. 22 per ton. Soda Ash could probably be used in the above formula at the rate of $3\frac{1}{2}$ lbs. instead of 7 lbs., but this needs experimental trial. It costs Rs. 5-8-0 per cwt. This wash should not be applied to young green wood or leaves but only to the old stems.

2. Fill a bucket one-quarter full of good fresh quick lime and add a good double handful of salt and a lump of tallow the size of one's fist. Slake gradually with water, stirring well to mix the salt and tallow. Add water gradually till a good consistency is obtained.

If rain does not fall within a few hours of its application white wash made in this way will not wash off and it is a useful wash, by the way, to apply to iron such as the roofs of buildings.

It would be of great interest if a few planters would experiment with these formulae and find out which are the cheapest and most efficient.

While on the subject of white washes the following method of making a good wash for lines, &c., may prove of interest to planters. It forms a waterproof paint which would therefore be harmful to Coffee trees, but it may be of use on the estate. I am indebted to the *Journal of the Jamaica Agricultural Society* for the formula which is as follows:—

> Dissolve 2 lbs. of ordinary glue in 7 pints of water and when all is dissolved add 6 ounces of Bichromate of Potassium dissolved in one pint of hot water. Stir the mixture up well and then add sufficient whiting to make it up to the usual consistency and apply with a brush in the usual way as quickly as possible.

This wash dries in a very short time and by the action of light becomes converted into a perfectly insoluble waterproof substance which does not wash off even with hot water, and at the same time does not give rise to mould growth as white wash made up with size often does. It may be coloured to any desirable shade by the use of a trace of any analine dye or powdered colouring, while by the addition of a small proportion of Calcium sulphite its antiseptic properties are much increased.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

Proceedings of a General Meeting of the Nilgiri Planters' Association held at the Collector's Office on Thursday, the 1st July, 1915.

PRESENT.—Mr. J. S. Nicolls (Chairman), Mr. L. A. Gerrard Rogers (Honorary Secretary), The Hon'ble Mr. E. F. Barber, Mr. R. Stanes, Mr. E. S. Clarke, Mr. D. Elkington, Mr. W. A. Cherry, Mr. C. L. Egan, Mr. K. J. Harper, Mr. C. Gray, Mr. A. Dandison, Mr. B. A. Marden, Mr. R. N. C. Grove, Mr. W. B. deCourcey, Mr. George Oakes, Mr. S. Rowson, Mr. T. Browne, Mr. W. Deane, Mr. J. B. Vernede, Mr. A. K. W. Downing. *Visitors.*—Mr. E. B. Loveluck, Mr. Leslie Rogers and Mr. Stonehewer.

Mr. J. S. Nicolls in opening the meeting said:—

"I should like to explain to you the reason for my occupying the Chair in place of the Hon'ble Mr. E. F. Barber. Mr. Barber having resigned the Chairmanship, the duties have fallen on me as Vice-Chairman. I am certain that all of you are in accord with my views in regretting Mr. Barber's resignation. I have agreed to take over the Chair for the current year and I hope this meeting will approve of my doing so. There are many important matters before you, and I hope that discussion will show that planters are united in furthering the prosperity of their industry."

No. 145. *Proceedings of last meeting* taken as read.

No. 146. *Election of Member of Committee.*—To fill existing vacancy, Mr. R. Stanes was elected.

No. 147. *U. P. A. S. I. Circulars.*—(*a*) Planting Exhibition, read Secretary, U. P. A. S. I. letter.

Members were asked to send exhibits.

(*b*) *List of members serving their Country.*—Read Secretary, U. P. A. S. I. letter. The Honorary Secretary was asked to send in a list of members.

No. 148. *Cardamoms.*—Read Mr. Anstead's letter *re* local sale of this product. The members interested were asked to write direct to the Mysore Pharmaceuticals.

No. 149. *Railway freight on Tea Seed.*—Read Secretary, U.P.A.S.I. letter with replies received from Railway Companies. S. I. Railway—Mr. Deane complained of long delay in delivery of tea seed by goods train and was asked to address the Honorary Secretary on the matter.

No. 150. *U. P. A. S. I. Agenda.*—This was read through and discussed and Delegates advised:—

(*a*) Election of Delegates to the U. P. A. S. I. Meeting:—Proposed by Hon'ble Mr. E. F. Barber and seconded by Mr. W. A. Marden, Messrs. Nicolls and Dandison were unanimously elected.

(*b*) *Railways in Planting Districts.*—In this connection, Mr. E. F. Barber read some interesting correspondence and dwelt on that portion of the Railway which would run through the Western side of the Nilgiris through Mysore and eventually reach the port of Cochin, which it was proposed to convert into a harbour. Such a system has the unanimous support of members present and the following resolution, proposed by Mr. R. Stanes and seconded by the Hon'ble Mr. E. F. Barber was unanimously carried:—

"That this Association strongly advocates the proposed Wynaad-Shoranur Railway which will be of special benefit to the Western side of the

Nilgiris and will no doubt lead up to the opening out of considerable land with Tea and Rubber. The Association further advocates the construction of the Cochin Harbour which will be of immense value to the Western Coast in general which is at present closed to all shipping during the South-West monsoon. The benefits would not extend to planters alone but the general produce of the West Coast, would find its way to such a harbour, which will finally lead to the establishment of an open produce market in Cochin.

(*c*) *Scientific Department.*—On a pamphlet with reference to the past history and proposed development of the Scientific Department, which has been circulated to Members, the Chairman invited the opinion of the meeting. Mr. Stanes inquired whether there were to be any further subscriptions to which reply was made that no additional subscription was to be asked from District Associations, but that private donations from firms and planters would be welcomed. The meeting was unanimous that Government should have the running of the Scientific Department on the best lines that could be advocated at the U. P. A. S. I. Annual Meeting.

(*d*) *Mr. Anstead's Tours.*—Members asked that Mr. Anstead should pay the Nilgiris a visit in September of this year or March of next year.

(*e*) *Planters' Benevolent Fund.*—On this subject Mr. Thomas Brown dwelt on the disqualification of members of the Eurasian and Anglo-Indian Community to the benefits of the fund, as he said that the rules distinctly restricted its benefits to Europeans. Mr. Brown thought that the Delegates should press at the U. P. A. S. I. meeting for the removal of this disqualification. Mr. Nicolls in replying said he was sure that all members of the Association would welcome Mr. Brown as a member of the Fund. A line had to be drawn somewhere and he regretted it being drawn to the exclusion of Mr. Brown. He was sure that no personal slight was meant. Mr. Brown said that he did not speak so much from the view of how the matter effected him personally but with a view to the fate of those members of the Anglo-Indian Community who have been subscribing and who would come to find out that under the rules such members would not be entitled to the benefits which they had anticipated. Mr. Brown pointed out that it was regrettable in this connection that many members of the Anglo-Indian Community did not come forward in this matter as there was a tendency on the part of many members of the community to hide the fact that they were members of that community. With a promise from Mr. Nicolls that he would again speak on the subject, the matter was recorded.

(*f*) *European Association.*—In this connection Mr. George Oakes asked if any thing was to be done in the matter of the Alliance such as had been done by the Chamber of Commerce and in Darjeeling. As in all probability this matter will come up at the U. P. A. S. I. meeting, there was no further discussion on it.

(*g*) *The Experimental Plot.*—With reference to the Experimental Plot, Mr. C. Gray's opinion being asked he stated, that the opinions of Mr. Butcher and Mr. Proudlock did not agree with those of Mr. Anstead as to the selection of the site.

With a vote of thanks to the Chair and to the Collector for the use of the room, the meeting terminated.

(Signed) J. S. NICOLLS.
Chairman.

(„) L. A. GERRARD ROGERS.
Honorary Secretary.

Central Travancore Planters' Association.

The Second Quarterly General Meeting of this Association was held on Saturday, 3rd July, at Ladrum Bungalow, at 10 a. m.

PRESENT.—Messrs. H. C. Westaway (Chairman), W. H. G. Leahy (Vice-Chairman), J. A. Richardson, J. S. Wilkie, F. W. Winterbotham, A. R. St. George, J. M. Wilkie, C. A. Mackenzie, F. Bissett, E. T. Atkins (Honorary Member), and R. P. Roissier (Hon. Secretary).

Correspondence.—All correspondence since the previous meeting was read by the Honorary Secretary.

The Honorary Secretary was instructed to write to the Chief Engineer regarding the bad state of the Kodamatha Landing at Kottayam.

Bangalore Delegate.—Proposed by Mr. Leahy and seconded by Mr. Roissier that Mr. Westaway be elected as one of the Delegates.—*Carried.* Proposed by Mr. Richardson and seconded by Mr. Leahy that Messrs. Bissett and Winterbotham be Delegates.—*Carried.*

It is hoped that two of the elected Delegates will be able to go to Bangalore but as there is some uncertainty it is left to these gentlemen to arrange amongst themselves as to which two will go. It was resolved that the Delegates be given Rs. 150 each for travelling expenses.

Delegates Instructions.—The Meeting then gave instruction regarding the items on the Agenda which interested us.

Tea Thefts.—This matter was discussed and it was suggested that a special Committee be formed and that the following gentlemen be asked to serve on this Committee:—

Messrs. D. McArthur.
" General Manager, Wallardie Tea Company, Ltd.
" W. H. G. Leahy.
" H. C. Westaway.
" R. P. Roissier.
" J. S. Wilkie.
" H. B. Kirk.

Roads and Communications.—The Honorary Secretary was instructed to write to the Chief Engineer regarding the very bad state of the Kottayam-Kumili Road between the 27th and 29th mile. Also to write to the Post-master-General, Madras, to draw his attention to the delay weekly in the delivery of English Mail, between Madras and Peermade. Also to the excessive time which letters take to reach Peermade from Mundakayam.

Rice Measures.—This was discussed.

War Funds—The Honorary Secretary has received Rs. 500 for the C. T. P. A. War Fund and it was decided to send this amount to the Lord Robert's Fund. The sum of Rs. 120 was also collected at the meeting for the purpose of sending Cigarettes to gentlemen from this District who are now serving at the Front.

Squatters taking up land on Estate Bounderies.—Mr. Leahy brought this matter before the Meeting and it was decided that the Honorary Secretary do write to the Commissioner, Devicolam on the subject. It was futher resolved:

" That all natives applying for land on Estate boundaries through the local Tahsildar or Proverthiar, the Commissioner be requested not to grant the same without reference to Estates concerned."

The Chairman proposed a vote of thanks to Mr. Winterbotham for placing his Bungalow at the disposal of the Meeting.

With a vote of thanks to the Chair, the Meeting terminated.

(Signed) R. P. ROISSIER, *Hony. Secretary.*

RUBBER TRADE ASSOCIATION OF LONDON.

MONTHLY STATISTICS,

JUNE, 1915.

IMPORTS of all kinds of Rubber into the United Kingdom.

From	May. 1915.	May. 1914.*	May. 1913.*	Five Months ended May. 1915.	Five Months ended May. 1914.*	Five Months ended May. 1913.*
Straits Settlements and Federated Malay States ...	3,157	2,106	1,976	20,316	12,659	10,041
Ceylon ...	666	481	289	7,280	3,136	2,372
British India ...	44	—	—	736	—	—
Dutch East Indies ...	257	—	—	970	—	—
Brazil and Peru ...	1,906	1,423	2,021	7,004	8,054	10,286
Africa ...	217	50	242	1,365	360	1,193
Other Countries ...	134	1,180	1,587	774	6,931	7,829
Total Tons ...	6,381	5,240	6,115	38,445	31,140	31,721

EXPORTS of all kinds of Rubber from the United Kingdom.

To	May. 1915.	May. 1914.*	May. 1913.*	Five Months ended May. 1915.	Five Months ended May. 1914.*	Five Months ended May. 1913.*
Russia ...	2,371	903	633	4,572	3,473	3,021
Germany ...	—	1,166	1,073	—	4,511	4,679
Belgium ...	—	169	164	—	1,011	833
France ...	733	708	438	2,811	2,915	1,988
United States ...	4,001	2,709	1,361	18,688	11,091	6,550
Other Countries ...	763	294	411	3,626	1,721	1,590
Total Tons...	7,868	5,949	4,080	29,697	24,722	18,661

* Including Waste and Reclaimed Rubber.

IMPORTS, DELIVERIES AND STOCKS in London and Liverpool, May, 1915.

		Imports, For May	Deliveries, For May	Stocks 31st May. 1915.	Stocks 31st May. 1914	Stocks 31st May. 1913.
London	Plantation ...	6,614	7,080	6,528	3,197	3,291
	Other kinds ...	24	42	567	664	1,019
	Total Tons ...	6,638	7,122	7,095	3,861	4,310
Liverpool	Para ...	1,572	1,494	1,182	918	1,299
	Other kinds ...	956	825	486	999	1,254
	Total Tons ...	2,528	2,319	1,668	1,917	2,553
Total Tons for London & Liverpool ...		9,166	9,441	8,763	5,778	6,863

SHIPMENTS FROM STRAITS SETTLEMENTS AND F. M. S,

	April,			Four Months ended April,		
	1915.	1914.	1913.	1915.	1914.	1913.
Tons ...	4,755	3,699	2,388	22,851	15,192	10,438

SHIPMENTS FROM CEYLON.

To	April.*	Four Months ended April. 1915.	1914.	1913.	1912.
United Kingdom ...	467				
Russia ...	15				
Germany ...	—				
Belgium ..	—				
France ...	17				
U, S. A. ...	475	5,969	4,730	3,295	1,716
Other Countries ...	38				
Total Tons...	1,012				

* Figures made up to April 26th.

U. S. A. IMPORTS AND EXPORTS.

	March.			Three Months ended March.		
IMPORTS.	1915.	1914.	1913.	1915.	1914.	1913.
India rubber ...	11,618	6,838	4,676	22,083	15,044	14,960
Gutta and Balata ...	503	1,455	1,365	2,953	2,935	6,101
Total Tons...	12,121	8,293	6,041	25,036	17,979	21,061
EXPORTS.						
India rubber ...	254	178	246	815	475	673
Gutta and Balata ...	35	14	8	164	28	32
Total Tons...	289	192	254	979	503	705

PARA RECEIPTS.

	May, 1915.	Jan./April, 1915.	July/Dec., 1914.	Total.
Rubber ...	1,905	12,800	12,743	27,448
Caucho Ball ...	920	3,090	1,552	5,562
	May, 1914.	Jan./April, 1914.	July/Dec., 1913.	
Rubber ...	1,680	13,310	14,630	29,620
Caucho Ball ...	1,180	4,030	1,760	6,970

MEMBERS OF DISTRICT ASSOCIATIONS WHO HAVE JOINED THE ARMY.

We publish the names of those who have joined the Army, as sent in by some District Associations, and trust that the remainder will send in theirs before the Annual Meeting, for publication. Any corrections and additions will be gratefully received so that the list may be as accurate and complete as possible.—(Ed.)

BABABUDIN PLANTERS' ASSOCIATION.

R. D. Lovett, Gundikhan Estate, Chickmaglur P. O. Vol. Coorg and Mysore Rifles, enlisted 16th Batt. (Public Schools) Middlesex Regiment.

L. F. Powell, Sumpigay Khan Estate. Vol. Coorg and Mysore Rifles. I. A. R. Commission, 3rd Sappers and Miners, Kirkee.

O. Watson, Sumpigay Khan Estate. Vol. Coorg and Mysore Rifles. I. A. R. Commisson S. & T. stationed Mhow.

KANAN DEVAN PLANTERS' ASSOCIATION'

P. G. Campbell, 2nd Lieut. (I. A. R. O.) attached to 127th Baluch Light Infantry.

W. J. Dixon, Corporal, 2nd King Edward's Horse which is now attached to the First Canadian Mounted Brigade.

H. Berry Hart. 2nd Lieut. (I. A. R. O.) attached to 140th Pathans.

R. Hedger, Captain, A. S. C., Aldershot.

J. H. S. Jameson, Lieut., 7th Seaforth Highlanders.

M. C. Koechlin, Corporal, 2nd King Edward's Horse which is now attached to the First Canadian Mounted Brigade.

B. Llewellyn, 2nd Lieut. (I. A. R. O) attached to 1st Bengal Lancers.

R. de C. Meade, 2nd Lieut., Norfolk Yeomanry.

H. L. Peel, 2nd Lieut., South Wales Borderers.

R. L. L. Peel, 2nd Lieutenant, R. F. A.

W. L, Ranking, Lieut., attached 33rd Cavalry, Persian Gulf.

W. D. K. Thellusson, 2nd Lieut., Hampshires.

A. Todd, Trooper, Middlesex Yeomanry.

R. D. Willis, 2nd Lieut., (I. A. R. O.) attached to 14th Lancers.

NILGIRI PLANTERS' ASSOCIATION.

Bradshaw, 2nd Lieut. I. A. R. C. now at Persian Gulf.

De Frevel, 2nd Lieut., (whereabouts unknown at present), 20th Hussars

C. H. Brock, Capt., I. A. R. O,, 21st Punjabis, now at Peshawar.

C. A. Browne. 2nd Lieut., I.A.R.O. (whereabouts unknown at present).

Fulcher, 2nd Lieut., I. A. R. O.. left Kurrachi 26th June to join a force in France.

W. H. Haly, 2nd Lieut., Hon. Artillery Co., Inf. Batt. now in France.

C. Hayne, 2nd Lieut., left to join a force in France.

Mr. Hedde, to French Army, rank unknown.

Colin Hindley, 2nd Lieut., I.A.R.O. (whereabouts unknown at present).

Lechler, 2nd Lieut., I. A. R. O. (whereabouts unknown at present).

L. L. Porter, Captain, I. A. R. O., 18th Bengal Lancers, now in France.

Reilly, 2nd Lieut., I. A. R. O., (whereabouts unknown at present).

P. A. Thompson, 2nd Lieut., I. A. R. O. (whereabouts unknown at present).

SHEVAROY PLANTERS' ASSOCIATION.

E. Dickins, 1st Lieut., and Garrison Engineer, Secunderabad.

E. Sans, has joined his Regiment in France and is serving now as interpreter.

SOUTH MYSORE PLANTERS' ASSOCIATION.

W. L. Crawford, Captain, Senior Capt. 7th Battalion of the Lincolns and is about to proceed to France with his regiment very shortly.

H. L. Hill, Lieut., attached to the 90th Punjabis and is guarding the oil pipes near Basara.

J. B. Russell, Corporal, R. C. (Madras Volunteer Motor Cyclist Corps) not known whether in France or Dardanelles.

SOUTH TRAVANCORE PLANRERS' ASSOCIATION.

R. M. S. Barton.————

G. G. Brown, Lahai Estate, Vadaserikara, Legion of Frontiersmen.

W. H. Chalmers, Braemore Estate, Kallar, Indian Reserve.

J. D. H. Cooke.————

A. V. Cree, Sittar Estate, Vadaserikara, 2nd Lieut., Welsh Fusiliers.

A. G. A. Dunning, Lahai, Vadaserikara, 2nd Lieut., Indian Regiment.

J. H. Parkinson, Koravantavalam Estate, Kalthuritty, Despatch Rider, R. F. C.

J. R. N. Pryde———

C. Searanckie, Koravantavalam, Kalthuritty, Commander, R. N.

R. Searanckie do do London Scottish.

M. F. Shore, Perinaad Estate, Vadaserikara, R. F. C.

Government Officials:—

W. H. Grant, Esq.————

———-Slater, Esq.,————

C. H. Thomas, Esq.,————

WEST COAST PLANTERS' ASSOCIATION.

Names.		Force to which attached where known.
C. S. Agar	...	————
T. B. Ashworth	...	Royal Engineers.
R. F. Bowles	...	Supply and Transport, Mhow.
C. E. M. Browne	...	I. A. R. O.
H. Browne	...	I. A. R. O.
C. W. Clode	...	————
T. D. Dixon	...	6th Warwicks.
A. G. Dunning	...	45 Sikhs.

W. A. Fleury	...	———
W. S. Halliley	...	7th Rajputs.
W. G. Haslam	...	26th Light Cavalry, France.
J. Horsfall	...	Motor Cyclists.
A. P. Kinloch	...	3rd Royal Warwicks.
R. Lescher	...	———
C. L. MacLean	...	———
Jasper Martin	...	Connaught Rangers.
E. G. Pitcairn	...	8th Black Watch.
H. C. Plowden**	...	Royal Engineers.
A. H. W. Sheldrick	...	———
J. C. Stewart	...	Guides.
L. Bell Syer	...	27th Punjabis.
E. M. Walker	...	Carnatics.
H. Walmesley	...	I. A. R. O.

* W. L. Crawford also a member of Mysore P. A.

** A. H. W. Sheldrick also probably a member of Coorg P. A.

WYNAAD PLANTERS' ASSOCIATION.

W. Everett Bownass (S. M. P. R.) East Indian Tea & Produce Co., Ltd., now 2nd Lieut, in the Royal Field Artillery.

G. R. Carson Parker, (S. M. P. R.) Panora Tea & Produce C., Ltd., now 2nd Lieut. in the Royal Field Artillery.

According to the *American Grocer* the net import of tea to the U.S.A. for the fiscal year ending June 30th, 1914, was 90,147,593 pounds at an average import cost of 18·4 cents per pound, equivalent to 0·90 pounds per capita. This is a decrease of 3,763,462 pounds in imports from 1912. From 1910 to 1914 the imports for five years were as follows :—

Year ending June 30th.	Net Imports lbs.	Average Import cost per lb. cts.	Consump- per Capita lbs.
1910	83,298,019	16·0	·89
1911	99,366,576	17·2	1·04
1912	100,394,896	18·0	1·05
1913	93,911,055	18·4	·95
1914	90,147,593	18·4	·90

The average annual net import for three years. 1912-14, was 94,817,848 pounds. The quantity is sufficient to make 663,725,936 gallons of beverage. The average cost per pound at retail is 35 cents, making the cost of tea at consumer price $33,186,246. Average annual per capita use in 1912 was 1·05 pounds, against 0·90 pounds in 1914. The extremes, 1·24 pounds in 1909; the lowest, 0·89 pounds in 1910. The decrease in consumption is a puzzle. It may be due in part to the increased favour accorded India and Ceylon tea which makes more gallons of beverage to the pound than China and Japan growths. The American people fail to appreciate the exquisite flavour of the finer teas, being more governed by price than quality. This is a wrinkle for the India Tea Cess Committee.—*Capital.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 31.] JULY 31, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish the Proceedings of the Wynaad Planters' Association. Also those of the South Mysore Planters' Association who passed a resolution expressing "their great disappointment at the resolve of the Mysore Durbar to shelve the Mangalore Railway Scheme." In last week's issue we referred to the Resolution about alien enemies passed unanimously and we hope to see a much more strongly worded and general one passed at the U. P. A. meeting. We publish also the proceedings of the Mundakayam Planters' Association. We note with great regret the death of Captain R. C. Milbank from wounds received at Hill 60. We ourselves had much pleasant and courteous correspondence from him when he was the Honorary Secretary of his Association. His name will ever be honoured wherever planters congregate. Mr. Murphy will represent his Association at the Annual Meeting.

We publish a further list of Members of District Associations who have joined the Army. Before the Annual Meeting we hope to be furnished with full and up-to-date lists, and trust that Delegates will make a point of bringing the latest with them, and with the latest information respecting those who are fighting for the Empire and Liberty.

We are indebted to *Capital* for an article on "Feeding Stuffs, their Imports and Exports in British India."

Page 384 will doubtless attract most attention as on it will be found a statement of the Export of Oil seeds for three years. There are also two interesting paragraphs dealing with the so-called "inexhaustible labour force of India" but the Establishment of our own Labour Department and the difficulties planters of Southern India have to contend with, rather mitigate against that statement, which really come from critics unfamiliar with Indian conditions.

We have received a circular from the Anti-German Union in England, the aims and objects of which are (1) to foster National ideals and to keep alive the patriotic spirit of the people. (2) to defend British freedom, rights and privileges against German aggression. (3) to defend Industry and British Labour against German competition. (4) to fight against German influence in our Social, Financial, Industrial and Political Life.

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association.

Proceedings of a Meeting held in the Meppadi Club on the 14th July, 1915.

PRESENT:—Messrs. Bisset, Blackham, Gauld, Gillatt, Malcolm, Powell, O. E. Windle, (District Superintendent of Police), and N. C. Whitton. (Honorary Secretary). *Visitors*—Messrs. Cheesman and Leslie.

Mr. Bisset in the Chair.

1973. *Proceedings of last Meeting*—were confirmed.

1974. *Roads. District Road No.* 31.—Correspondence with the District Board Engineer was read and Noted. The Honorary Secretary was instructed to draw the District Board Engineer's attention to the abutments at the Bridge near the 1st mile 3rd furlong from Vayitri, which have been recently built and are already falling away.

Calicut-Wynaad Road.—Read letter from the Executive Engineer stating that the bridge at mile 24-1 had been temporarily put in order. Recorded with satisfaction.

1975. *Post Offices.*—Read correspondence with the Postmaster-General with reference to the keeping open of the Meppadi Post Office for longer hours. It was resolved, as the hours detailed by the Postmaster-General are of little additional advantage, that the Postmaster-General be written to again asking him to have the hours for telegrams altered to, from 10 a.m. to 5 p.m.

It was noted with satisfaction, that sanction had been obtained for the removal of the Vellara Mulla Post Office to a site on Pootoomulla Estate.

Calicut-Vayitri Telegraph Line.—Correspondence was read between (1) the Postmaster-General, Traffic, Madras, (2) The Superintendent of Post Offices, Malabar Division, and the Honorary Secretary. The meeting noted with regret the Postmaster General's reply to the Honorary Secretary's letter, and the Honorary Secretary was instructed to write again to the Postmaster-General pointing out the importance of this telegraph line to the District, and to request that he be definitely informed whether it is intended to abolish the line or not.

1976. *District Board Membership.*—Further correspondence was read on this matter. The Meeting decided that Dr. Milton's resignation was unavoidable, having regard to the Collector's letter.

The Honorary Secretary was asked to write to Dr. Milton expressing the Association's very hearty thanks for his services on the District Board and to inform Dr. Milton that the Association fully appreciates all that he has done for the District.

Proposed by Mr. Malcolm and seconded by Mr. Powell that Mr. T. S. Gillatt be nominated as the Association's representative on the District Board.—Carried unanimously.

1977. *U. P. A. S. I. Meeting.*—The Meeting decided that Rs.200 each be voted for the Delegates expenses.

The Agenda paper was discussed, and certain points noted to be dealt with by the Delegates.

Under "Labour Department" the Delegates were instructed, "to ask for a clear definition of the position of non-subscribing members who are members of the U. P. A. S. I.; and as regards the financial position of the U. P. A. S. I. to the Labour Department."

1978. *Poolupadi Hotel.*—It was decided to spend the sum of Rs.40 in having the stables put in order.

1979. *Cattle Trespass.*—The Honorary Secretary was instructed to write to the Collector of Malabar asking him if he can see his way to issue orders to the local Magistrates to have the maximum fine inflicted in cases of cattle trespass, as so much damage is being done to Estates, also, to ask if the pound fees cannot be enhanced to at least one rupee per diem.

A vote of thanks to the chair terminated the meeting.

(Signed) J. W. G. BISSET,
Chairman.

(„) N. C. WHITTON,
Honorary Secretary.

South Mysore Planters' Association.

A Meeting of the S. M. P. A. was held at Arehully, on the 18th July, 1915.

PRESENT:—Messrs. M. J. Woodbridge, (President), J. G. H. Crawford, F. M. Hamilton, C. J. Hayward, E. W. Rutherford, E. V. Hunt, G. N. Frattini, K. Thamia, K. T. Seshaya, A. Thomson, (Honorary Secretary.)

The President in the Chair.

Mr. A. Durham's proxy was ruled out of order.

The minutes of the last meeting were passed.

LOCAL BOARD MEMBER—Mr. Lake was elected.

U. P. A.—Mr. Hayward was elected delegate to the U. P. A. meeting.

The U. P. A. Agenda was gone through and the sense of the meeting was taken on various points.

DASSARA.—Mr. J. G. H. Crawford, was elected Delegate.

ARSIKERE-MANGALORE RAILWAY.—The President spoke as follows;—

"It is with a sense of great disappointment that I bring before the meeting to-day the subject of the Arsikere-Mangalore Railway.

"Two years ago, the Dewan assured us when he visited Saklaspur, that "On the very day on which the British Government sanctioned their part of the line in South Canara, the Mysore Durbar would commence construction." These are his very words. At the U. P. A. meeting that year, we were assured that the question of this railway was practically settled and that this subject which had been on the U. P. A. agenda for many years was at last disposed of in a satisfactory way.

"Again, at our Jubliee meeting, your Executive were able to assure you, that this railway which was one of the original objects for which this Association had been formed 50 years previously, was likely to be carried through at last.

"And now, when everything was cut and dried, and when we fully expected to hear that construction had actually commenced, the Mysore Durbar

seem to withdraw altogether from the scheme and refuse to do their part. I do not know the reason, and as far as I know no reasons have been given. I propose to ask your Honorary Secretary to read the correspondence on this subject, but before doing so, I should like to make a few remarks on a new proposal that has been put forward therein. This is a railway from Cochin through Wynaad and part of Coorg to join up with the Mysore system and thence continued through Hassan and Chickmaglur, *i. e.*, to run parallel to the planting districts some miles to the East. Now, in my opinion, this can never be of any use to us. Our produce would go as before by carts to Mangalore. It would not help us in any way as regards labour; in fact very much the reverse. It would have the same effect on our Mysore labour as the coast Railway to Mangalore has had on our South Canara Labour that is, it will take it away to the districts south of us. It is always much easier to get a cooly to the nearest Railway and start him on a joy ride in the train, even if his destination is unknown to him, than it is to get him to face a tramp of several days to the Mysore Malnaad. As to the effect of this promised Railway on such questions as the Depopulation of the Malnaad and The Economic development of this part of the Province of Mysore, I think we may take it that if this railway is taken seriously into consideration all chance of getting a direct outlet to the West is gone for ever. This being the case, the Government enquiries into the depopulation, or rather repopulation, (as the depopulation is in a fair way of being an accomplished fact,) becomes a farce. We all know that the people from the East are unsuited to this climate. Being used to the dryness of the Moodle they cannot stand the damp of the Malnaad. If the Malnaad is to be repopulated it must be from the West by the people who are used to a similar climate, and this can never take place without direct Railway communication with their own country. Enquiries into the Economic development also become useless without direct railway communication to the West, as this is the one thing needful. The most likely development in the Malnaad are in low grade ore or wood pulp and in both of these everything depends on cost of carriage to the Coast. In conclusion, I believe that a railway from East to West means repopulation and Economic development to the Malnaad, and on the other hand railways from North to South outside the limits of the Malnaad mean depopulation and practical abandonment of the country and the creation of a huge game preserve, a result that would no doubt be welcomed by many Officials who would not then have to put in service in a country they so fail to appreciate."

After some discussion by most of the members it was resolved:—That this Association wishes to express their great disappointment at the resolve of the Mysore Durbar to shelve the Mangalore Railway scheme, especially after the Dewan's statement to a deputation of this Association at Saklaspur two years ago, *i.e.*, "on the very day on which the British Government sanction their part of the Railway the Mysore Durbar would commence work on their section."

ROADS.—Mr. Rutherford stated that all roads were very bad in the district. Mr. Crawford said that the road between Hassan and Arsikere was in an infamous condition. The Gonebede and Hanbalu roads came in for the usual criticisms.

MAIL SERVICE.—Mr. Crawford and Mr. Hamilton spoke on the disgraceful condition of the Mail Service. The following Proposition was put to the Meeting by Mr. Crawford and seconded by Mr. Hamilton and carried unanimously. "This Association notices with regret that in spite of repeated representations to the Postmaster General in regard to the late Arrival of

the Mails at different Post Offices in the Malnaad no improvement has been affected. The Tongas arrive hours late at their destination and Mails are consequently often not delivered till the following morning to the inconvenience of every one" :—

COUNCIL OF MYSORE ASSOCIATION.—The N. M. P. A. original proposition was put to the meeting and was lost, and therefore their agreement with the S. M. P. A. proposal holds good. Mr. Woodbridge was elected member of the Council.

N. M. P. A. LABOUR LAWS.—Proposed by Mr. Hamilton and seconded by Mr. Hayward : " That a committee be elected to go into the proposed rules." Carried. One vote against. Messrs. Lake, Hamilton, and Hayward were elected.

ALIEN ENEMIES.—Proposed from the Chair and carried unanimously : " That this Association is strongly of opinion that all Alien Enemies, especially missionaries, should be interned and views with grave concern the presence of a number of Alien Enemies in the employ of the Mysore Government." The Honorary Secretary was instructed to forward a copy to His Majesty's Resident of Mysore.

After a vote of thanks to the Chair the Meeting terminated.

(Signed) A. THOMSON,
Honorary Secretary.

Mundakayam Planters' Association.

Proceedings of the General Quarterly Meeting held at the Mundakayam Club, on Saturday, 26th June, 1915, at 10 a.m.

PRESENT.—Messrs. J. J. Murphy (Chairman), A. Hamond, R. Harley, Wm. Hendry, J. A. Richardson, E. Hall, J. West, D. U. Somers, S. P. Eaton, E. Vincent, J. H. B. Sullivan, F. Simmons, H. B. Kirk, W. A. Asher, T. H. Fitchett, N. D. Pollock, J. S. McKill and G. West (Honorary Secretary.) and *By Proxy*—G. H. Danvers Davy.

The Chairman said that before commencing the business of the Meeting he had to ask the Association to put on record the great regret at the death from wounds received at Hill 60 of Capt. R. C. Milbank who was Honorary Secretary to the Association when war was declared. The assent of members was signified by all standing.

Minutes —The Minutes of the last General Meeting were held as read and confirmed.

Before proceeding with the business on the Agenda, the Chairman intimated that as a result of correspondence with the *Times of Ceylon* a free passage home was available for a Mundakayam man anxious to join the Army.

Deputation to Dewan.—Mr. Hamond read the petition which he had presented to the Dewan. He also stated that his representations were well received by the Dewan and that, no doubt, they would receive due consideration by His Highness' Government. On the motion of the Chairman a unanimous vote of thanks was passed to the members of the deputation. After discussion in Committee, Mr. Richardson said that he would be glad to assist the Associatian by bringing forward the matter at the next Council Meeting, if considered necessary. On the proposal of the Chairman, a Sub-Committee consisting of Messrs. R. Harley, S. P. Eaton, H. B. Kirk and

Wm. Hendry was appointed to go into the question of the Town Improvement Committee Scheme and to report before next Quarterly General Meeting.

U. P. A. S. I. Labour Department.—Mr. Hamond read correspondence with the Deputy Director, Coimbatore, and made a statement concerning same to which Mr. Richardson replied. It was resolved by a majority (63 votes to 29) to send the correspondence to the Secretary, U. P. A. S. I. with the Meeting's opinion of same.

Cattle Pound.—The Honorary Secretary stated that the sum of Rs.395 had been subscribed from the local Estates for the erection of this building and the Chairman proposed that Mr. Kirk be asked to undertake the erection of the Pound. This Mr. Kirk agreed to do.

Cigarette Fund.—Mr. Kirk stated that he had heard from one of his Assistants who was at the front, of the difficulty and expense in obtaining an adequate supply of Cigarettes in the Trenches. After discussion in Committee, he proposed: "That a subscription list be opened and that if sufficient support be provided, cigarettes would be sent to Mundakayam men who have left the District since the War broke out and have joined the Army: the minimum subscription to be Rs.10 for 5 months." This was unanimously carried and Mr. Kirk kindly undertook to act as Honorary Treasurer of the Fund. In this connection, Mr. Richardson suggested that some central fund for similar contributions should be formed and said that he would bring the matter before the Central Travancore Planters' Association.

Registration of Carts and other Vehicles,—The Chairman pointed out the difficulty there was in identifying carts or other vehicles using the public roads and the desirability that all these should be registered. The Honorary Secretary was then requested to write to the Secretaries of the other Associations and to the Government, on the subject.

Telegraphs.—Mr. Hamond stated that while motoring from Kottayam, he narrowly escaped an accident on account of a telegraph wire having fallen across the road and which had not been removed. Mr. Richardson also complained of a similar experience and the Honorary Secretary was asked to communicate with the Superintendent, Telegraph Department and also to the Commissioner of Police with reference to this.

Delegate to the Annual General Meeting of U. P. A. S. I. at Bangalore.—Mr. J. J. Murphy was unanimously appointed Delegate from this Association and received instructions as to the points which he would bring before that Association.

Correspondence,—A letter from Mr. J. R. Vincent, with reference to rates paid by the Ropeway Co., was read. Mr. Richardson, the Company's Chairman, explained the matter satisfactorily.

The Honorary Secretary also read a letter from Mr. Norton requesting a list of the members of this Association who had joined the Army, for publication in the "Planters' Chronicle" and he was requested to compile same.

Other correspondence was laid on the table and the Meeting then terminated with a vote of thanks to the Chair.

(Signed) J. J. MURPHY,
Chairman.

(„) GEORGE WEST,
Hony. Secretary.

MEMBERS OF DISTRICT ASSOCIATIONS WHO HAVE JOINED THE ARMY.

CENTRAL TRAVANCORE PLANTERS' ASSOCIATION.

Estate.	Name.	Rank.	Regiment.
Stagbrook	H. C. Bracher	2nd Lieut	106th Pioneers, I. A. R. O.
Pambanar	J. H. Cautlay	do	Royal Horse Artillery
Cheenthalaar	T. S. Connor	do	——— I. A. R. O.
Dymock	J. D. Deane Drummond X	do	Royal Horse Guards.
Munjamullay	B. L. Erskine X	Captain	7th Manchesters,
Tungamullay	G. P. Farley X	2nd Lieut	26th Punjabis, I. A. R. O.
Vembenaad	R. L. Goldsmith X	Private	Motor Cycle Corps.
Bon Ami	R. E, Haslam X	Lt. & Act. Captain	26th Light Cavalry, I. A. R. O.
Woodlands	R. D. Scoble Hodgins X	———	Canadians.
Nellikai	F. M. Lowder X	Corporal	Motor Cycle Despatch Riding Contingent attached, R. E.
Injikadu	C. Martin	2nd Lieut	R. G. A.
Thengakal	W. W, Moser X	do	10th Border Regt,
Arnakal	W. S. Walford	do	10th Worcesters,

N.B.—Those marked X are now serving somewhere in France or have left for that destination.

There are still the following to be added but I cannot at present give you the required information :-

Messrs. Rhodes, Stewart, Frelawny, Browne and Agar.

KANAN DEVAN PLANTERS' ASSOCIATION,

L. Hayes, 2nd Lieut. I. A. R. O., attached to the 20th Duke of Cambridge's Own Infantry.

E. M. Milne, 2nd Lieut. I. A. R. O., attached to Duke of Wellington's Regiment.

MUNDAKAYAM PLANTERS' ASSOCIATION.

Lce.-Sergt., J. H. Byrne, H. L. F., c/o Dorset Regt., c/o, Post Master, Bombay.

2nd Lieut. R. L. Cavell, 86th Carnatic Infantry, Fort St. Ge6rge, Madras.

2nd Lieut. E. S., Conner, Royal Garrison Artillery.

Corporal H. E. R. Craig, Madras Volunteer Cyclists Corps, France.

2nd Lieut. G. C. Gilbert.————————

2nd Lieut. E. R. Gudgeon, 2nd Wessex Brigade, Royal Field Artillery.

Private J. Y. M. Henderson, 9th Battalion, Royal Scots.

Corporal C. H. Horsfall, Madras Volunteer Cyclists Corps, France.

2nd Lieut. C. M. Hunnybun.————————

Private C. Lane, Melrose, Dulwich, Surrey.

2nd Lieut. R. Lescher, North Staffordshire Regiment.

2nd Lieut. R. Lester, 52nd Sikhs, Bannu, Punjab.

2nd Lieut. C. Martin, Royal Field Artillery.

Capt. R. C. Milbank, West Ridings Regiment, (died of wounds).

Lieut. K. E. Nicoll, Army Service Corps.

2nd Lieut. J. O'Reilly, 2nd Battalion, Royal Irish Regiment, France.

2nd Lieut. L. Price, Madras Volunteer Cyclists Corps, France.

Private E. R. Reid, 7th Hants. Regiment, Delhi.

Private R. J. Scarbrough, Devonshire Regiment, Surrey.

2nd Lieut. N. J. Strachan, Dorsetshire Regiment.

2nd Lieut. S. Tatham ————————

NORTH MYSORE PLANTERS' ASSOCIATION.

Lieut. A. F. Evetts of Netracondah Estate, 3rd Battalion, Oxford and Buckingham Light Infantry.

2nd Lieut. R. W. Fremlin, of Buskull Estate, I. A. R. O., believed to be now in France.

WEST COAST PLANTERS' ASSOCIATION.

C. E. M. Browne and H. Browne are in the 25th Punjabis, Jhelum and not in the I. A. R. O. as previously stated.

WYNAAD PLANTERS' ASSOCIATION.

2nd Lieut. B. D. Darkin (S. P. M. R.) of Meppadi, Wynaad Tea Co., Ltd, Royal Field Artillery.

A. R. Simpson, (S. P. M. R.) of Meppadi, Wynaad Tea Co., Ltd., I. A. R. O., Quetta.

FEEDING STUFFS.

Imports and Exports of Feeding Stuffs in British India.

The following is extracted from an article dealing with 'The International Movement of Feeding Stuffs' which appeared in the *Monthly Bulletin of Agricultural Intelligence* for April 1915. The information was supplied by the Department of Revenue and Agriculture for India:—

"The chief concentrated cattle foods used in India are:

1. Cotton Seed.
2. Oil cakes—sesamum, linseed, safflower, and coconut.
3. Grains—oats, barley and maize.
4. Pulse, gram, kulthi (*Dolichos biflorus*), guar (*Cyamopiss psoraloides*) and lang (*Lathyrus sativus*).
5. Husks (bhusa) of various grains and pulses, as well as wheat bran and other by-products (chuni) got in the preparation of pulses.

Cotton seed is used in cotton-producing districts for milch cattle and buffaloes. No statistics of production or consumption are available.

Sesamum, rape and linseed cakes are the important oil cakes used generally. Statistics of production and consumption are not available but some idea can be formed from the production and export of oil seeds. On an average, during the last five years, 481,240 long tons of sesamum seed have been produced annually in India; of this 113,410 long tons are exported, leaving 367,830 tons which are pressed in India and which may be supposed to yield roughly 250,000 long tons of cake. A small quantity of the cake is exported and the rest is consumed in the country. In the same way the production of linseed cake comes to roughly 125,000 long tons, out of which some quantity is exported, but statistics are not available.

Cereal grains are mostly used by Europeans and on Government Farms, as cultivators cannot afford to use them generally as cattle food. There are no statistics.

Pulses, etc., are used to some extent by well-to-do cultivators but no statistics are available.

Husks are produced in cultivators' own homesteads and are used by them sometimes for milch cattle and hard-worked animals when available.

Feeding Stuffs.	Exports.		Imports.	
	1912-13 metric tons.	1913-14 metric tons.	1912-13 metric tons.	1913-14 metric tons.
Fodder, bran & pollards:				
Bran and Pollards ...	232,645	225,556	—	—
Other ...	11,610	7,826	—	—
Total ...	244,255	233,382	3,153	3,874
Oil cakes;				
Castor ...	7,121	4,981	—	—
Coconut ...	6,506	4,276	—	—
Cotton ...	7,118	10,596	—	—
Groundnut ...	63,397	63,022	—	—
Linseed, rape, sesamum ...	73,154	90,924	—	—
Others ...	7,083	4,327	—	—
Total ...	164,379	178,126	19	86

Exports of Oil seeds and Fruits from British India.

Oil Seeds and Fruits.	1911. Metric Tons.	1912. Metric Tons.	1913. Metric Tons.
Linseed	522,000	354,000	414,000
Groundnut	191,000	243,000	278,000
Rape	235,000	218,000	249,000
Sesame	95,000	78,000	112,000
Cotton	203,000	130,000	284,000
Copra	31,000	34,000	38,000
Bassia	40,000	13,000	33,000
Poppy	35,000	23,000	19,000
Total Oil seeds and Fruits ...	1,352,000	1,093,000	1,427,000
Yielding cake	676,000	546,500	713,000

There has been recently recurrence of references to India's "inexhaustible labour force," with advice how to utilise it. Lord Curzon once complained of not dissimilar asseverations concerning India's "inexhaustible water supplies," with advice how to utilise them. It has ever been the case that the most dogmatic opinions on Indian affairs have come from critics unfamiliar with Indian conditions, and the suggestion of inexhaustible labour forces is as far removed from reality as the suggestion of inexhaustible water-supplies. The labour exists, but its availability is limited. In these circumstances, labour emigration to foreign parts constitutes cause for resentment, and any restrictions on its continuance are observed without regret.

Only 2,698 emigrants were despatched from Calcutta in 1914 and the number of licenses issued to recruiters was 643, or 568 less than in 1913, the decrease being partly due to the stoppage of recruitment during the latter half of the year and partly to the amalgamation of the agencies for the British colonies, as under the new arrangement only one license is required for the amalgamated agency instead of two as formerly. In all, 5,145 emigrants—4,026 less than in the previous year--were registered in 1914, large numbers being rejected, and the number embarked being reduced to the total above stated. During the year 2,961 emigrants left the colonies, of whom 843 brought savings amounting in the aggregate to Rs. 4,48,284. The remaining 2,118 emigrants, including 189 adults, are said to have returned empty handed. The average savings per head of returned emigrants were Rs. 151-6-4 as compared with Rs. 181-3-9 in 1913. Remittances from Mauritius have been steadily rising and in 1914 amounted to Rs. 139 lakhs, or more than twice the amount sent in 1912. The average remittance per head of emigrant population, however, decreased in respect of all the colonies, except Mauritius and Trinidad. The remittances from Mauritius and Fiji, Government believe, would have been larger, but for the fact that many immigrants invest large sums in immoveable property and livestock, and that many of them have settled down with their wives and children and are therefore under no necessity of sending money to India.—*Capital.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 32.] AUGUST 7, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish an extract from Mr. Lyne's Administration Report (Ceylon) dealing with locally manufactured coagulants. When War broke out considerable alarm arose among planters when it was realised that supplies of acetic acid, almost all of which came from Germany and Austria were likely to run short. So both Government Chemists and private investigators have been busily engaged experimenting.

The *Gardener's Chronicle* supplies us with an interesting article entitled "Masters" lecture on the influence of Weather on soils. The lecture was delivered by Dr. E. J Russell of the Rothamstead Experimental Station, whence so much valuable information has come, at the Royal Horticultural Society's Hall. The para on "sick" soils which have been examined and the results traced to two causes is interesting. What planter does not have some "sick" soil on his Estate, and has not tried all sorts of remedies? A sample of that particular "sick" soil should be sent for analysis when a remedy will soon be found.

Under the heading of "Rubber" we publish an interesting article from *Capital*. It is remarked that the South India Rubber Industry is full of potentialities, and will doubtless attract the attention of the investor.

There has been a falling off in Emigration during 1914 as compared with 1913. Still the drain on the resources of Southern India labour is serious and will become more so after the war when there will be a greater want to be filled. Assam is organising a Labour Board, South India already has its Labour Department, but it is prophesied that those two organisations will tend to "improve facilities for recruiting and therefore no doubt a bigger supply of labour and this is undoubtedly the plantations greatest need" An interesting tabular statement is given.

We are indebted to Dr. Leslie Coleman for a very interesting article on "Ants and their Relation to Green Bug." The experiment tried in Java might easily be tried here.

We publish three letters on "Coffee Borer." The original from Mr. Kent has, elicited two interesting letters from our own Planting Expert and Dr. Leslie Coleman.

COAGULANTS

Locally Manufactured Coagulants for Rubber.

Mr. R. N. Lyne in his Administration Report for 1914 (Ceylon) says:—

Considerable alarm arose among rubber planters when on the outbreak of war it was realised that supplies of acetic acid, almost all of which came from Germany and Austria, were likely to run short. Mr. Campbell, who was at that time Acting Government Chemist, immediately began investigating the question of being able to provide acetic acid or some substitute locally, and numbers of private investigators also set to work on the same problem. Cocoa juice, coconut water, and coconut vinegar were all found to be suitable coagulants, especially coconut water, which is now being regularly used on some rubber estates. At Peradeniya pyroligneous acid from the destructive distillation of wood and of coconut shells was produced by an improvised still and the results made public. Supplies of acetic acid soon began to arrive from England and the urgency of the question passed, but results which will probably prove of permanent benefit to the island remain. Acetic acid can be made cheaply and in ample quantity from coconut shells. It is not sufficiently clear in colour for the coagulation of rubber that is to be made into first latex crepe, but good, clear smoke sheet can be, and is being, made in large quantities with it. Ceylon produces enough coconut shells to provide sufficient acid for all the smoked sheet made in the island—perhaps in the whole East—and I think our resources in that respect may very likely be turned to good account. The cost of acid works out at much less per lb. of dry rubber with crude acetic acid from coconut shells than with the imported product. Mr. Bamber has shown that considerable economy could be effected by using acetic acid prepared from coconut shells over the imported product. He calculates that the cost of acid per lb. of dry rubber is 0·08 cent in the case of the crude product, as compared with 0·39 cent to 0·65 cent when ordinary acetic acid is used.

In the Report of the Ceylon Government Chemist for 1914 the following history of the investigations into the most suitable products for the local manufacture of Acetic Acid is given:—

Coconut shells when subjected to dry distillation yielded the largest proportion of acetic acid, the crude liquor containing from 8 to 12 per cent. of pure acetic acid. It also yielded a valuable creosote, which could be well utilised for the preparation and preservation of latex and smoked rubber.

Small stills have been erected on some mixed coconut and rubber estates, which are now producing all the acetic acid required on the estate for the manufacture of the rubber at an economical price.

The value of vera wood for this purpose was also investigated. This tree, "Hemicyclia sepiaria," forms a large proportion of the forest in parts of the Northern and North-Central Provinces, and is useless for anything except as fuel or the production of charcoal and distillation products.

The average products from the distillation of tropical forest woods are:—

		Per cent.
Charcoal	...	30·00
Tar	...	4·65
80 per cent. acetic acid	...	6·10
Mithyl. alcohol	...	1·90

The crude pyroligneous acid or wood vinegar contains from 3·8 to 8 parts of pure acetic acid, and is about the correct strength for adding to latex without dilution. The actual results from distilling vera wood that had been cut and dried for two months were :—

		Per cent.
Charcoal	...	25·00
Crude acetic acid liquor	...	40·70
Tar	...	1·85

The crude acetic liquor contained 4·14 per cent. pure acetic acid, and had a specific gravity of 1,022° .

Several re-distillation experiments were made, and it was found that the dark crude liquor yielded a pale yellow clear solution of acetic acid by one distillation after adding a small amount of *fresh* charcoal to the liquid before redistillation. The solution could be utilised for the production of ordinary crepe, and the crude liquid for the manufacture of smoked sheet or darker coloured rubbers.

The question of utilising the forests for locally producing the acetic acid required for the rubber industry in Ceylon and the East generally, is under considera'ion.

The charcoal produced from vera wood was valued at Rs. 40 per ton in Colombo, and it was stated that if a plentiful supply of such charcoal was available, the use of the economical suction gas plants could be extended.

The value of the products from one ton of vera wood is estimated to be as follows : —

		Rs.	c.
560 lb. charcoal at Rs. 25 per ton	...	14	0
942 lb. crude acetic acid at 3 cents per lb.	...	28	26
80 lb. tar at Rs. 12 per barrel	...	4	0
Total	...	46	26

The sun-dried smaller branches and leaves of the vera tree used for heating the charcoal retorts yielded 6·78 per cent. of pure ash, of which 28·38 per cent. is soluble in water. The ash contained 21 per cent. lime, 20 per cent. potash, and 7½ per cent. phosphoric acid, and at the normal manurial value of these constituents the ash is worth Rs.100 per ton, the potash alone making its value Rs. 71 per ton.

As the supplies of potash salts from Stassfurth are now not available, the production of such ash either from the above source, or from the large areas of waste scrub land in the Northern, Eastern, and Southern Provinces, would form a useful substitute. These areas are for the most part above the irrigation level and with poor soil, so that the burning of the jungle for the production of potash for utilisation in the higher cultivated districts of Ceylon would have no injurious effect, and might become a revenue producing industry for those districts.

INFLUENCE OF WEATHER.

"Masters" Lecture on the Influence of Weather on Soils.

The fourteenth "Masters" lecture was given by Dr. E. J. Russell of the Rothamsted Experimental Station, on Tuesday last, at the Royal Horticultural Society's Hall, and dealt with the influence of weather and other natural conditions on the soil changes that had been discussed in the previous lecture. It had been shown that the decomposition of the residue of plant materials in the soil is of fundamental importance in soil fertility, determining on the one hand the production of necessary plant nutriments and on the other the extent of accumulation of organic material in the soil, which, in turn, determines many of the soil properties. Three methods are adopted in studying this decomposition and in finding how it is affected by changes in conditions such as commonly occur in nature: measurements are taken of the rate at which oxygen is absorbed or carbon dioxide is given off by the soil; of the rate of ammonia or nitrate formations in the soil; and estimates are made of the changes in numbers of bacteria in the soil.

The first two can be determined as accurately as is desired, but the accurate estimation of bacterial numbers is not yet possible and the values are comparative only; nevertheless, they are of considerable value for this work.

It may be taken as a general rule that the soil organisms, being living creatures, are dependent on suitable temperatures and water supply, that they must have food and sources of energy to enable them not only to live but also to carry on those reactions which involve the accumulation of energy, or, in other words, resemble rolling a ball up a hill. These are general requirements that can safely be predicted of any living organism. In addition there is the special requirement that has been discovered by experiment; the need for calcium carbonate, without which many soil organisms will not act efficiently.

In dealing with soil, however, it is commonly the unexpected that happens and experimental confirmation is rquired at every stage. Thus the effect of increases in temperature on the bacterial numbers is quite different from what might be expected; instead of rising, the numbers remain fairly constant up to about 80 degrees Fahr., and then they begin to fall. In like manner increases in water content of the soil do not lead to regular increases in bacterial numbers; there is a rise at first, but it is not sustained. So, in natural conditions, the numbers of bacteria do not show the expected fluctuations in the rise in temperature or moisture content. The discrepancy has been traced to the circumstance that the soil population is complex and is not formed of bacteria only. The figures do not give the effect on the whole soil population, but only on part of it, and they afford further evidence of the conclusion to which other experiments lead, namely that the soil bacteria are subject to the operation of some limiting factor distinct from temperature and moisture content and food supply. There is reason to suppose that this limiting factor is to be found in the action of some of the less resistant and larger forms, such as the protozoa, which keep down the numbers of the bacteria. This hypothesis explains all the facts that have yet been ascertained, but so many protozoa have been discovered in the soil that it is difficult to pick out the exact offenders and render the hypothesis more precise from the purely zoological standpoint.

The rate at which plant residues are decomposed and plant food is produced in the soil is, as we have just seen, indicated by the amount of

carbon dioxide formed. The amount is found to follow the soil temperature during the winter months, but not during summer; indeed, during hot, dry weather the amount is distinctly low. Nor has the amount of carbon dioxide any very close connection with the moisture content; it depends more upon the rainfall.

Thus it appears that the rain does something more than add water to the soil, and an interesting problem is reopened which has, in the past, occupied a great amount of attention from agricultural chemists. From time immemorial practical men have felt that rain had a fertilising effect. Mediæval writers attributed it to some aerial spirit of celestial nitre washed down. Liebig more precise, put it down to ammonia. As a result of Liebig's support a vast number of analyses have been made of rain from all parts of the world, but all agree in showing that there is not enough ammonia present to make any practical difference.

The explanation offered is very simple. Air readily penetrates into a well-cultivated soil so that the soil atmosphere is not unlike our own. But the air dissolved in the soil water is something quite different; it is chronically short of oxygen, so that the plant roots and micro-organisms immersed in it could probably always do with more. Now rain is a saturated solution of oxygen, and when it falls on the soil it not only supplies the needful water, but also renews the stock of dissolved oxygen, and thus gives the micro-organisms and the plant roots a new lease of activity.

But the soil is not governed solely by the conditions that happen to obtain at the time being, it is profoundly influenced by those that have passed: indeed, one might go so far as to say that its properties are determined largely by its history. The shape, the size, and to a large extent, the composition, of the mineral particles are the result of forces that caused the fragments of rock to chip off long ages ago, and have governed their wanderings ever since. The nature of the organic matter depends on the past vegetation which, in turn, depends on the climate; the micro-organic population is determined by the same cause. The soil as we see it to-day is the result of changes long since past as well as those still proceeding. In short, the soil is the embodiment of its history, and can only be read aright in the light of its history.

This is equally true of the minor events. Changes in conditions do not cease to be effective as soon as the old conditions are restored; they leave their mark which may persist for a long time. Very unexpected effects are sometimes produced. Experiments at Rothamsted and elsewhere have brought out the apparent paradox that conditions harmful to life lead to greater activity of micro-organisms as soon as they have passed, while conditions favourable to life finally cause decreased activity.

Thus, if a soil is dried for a long time and then remoistened or frozen very hard and then allowed to warm up, or heated, or treated with mild antiseptics—all processes harmful to life—it becomes a better medium for the growth of plants and of bacteria; the production of nitrate is increased, and the supply of phosphate becomes more available.

Again, whenever a soil is well supplied with organic matter, with moisture, and kept well warmed, the bacterial numbers do not keep as high as might be expected; on the contrary they tend to come down. After a time these soils do not produce their full effect, and they are said to become "sick." Instances occur in commercial glasshouses which are kept at high temperatures where the soil, after a season's use, becomes unsuitable, and is, therefore, thrown out, all its valuable manurial residues being sacrificed.

"Sick" soils have been examined in some detail and the trouble was traced to at least two causes: an accumulation of disease organisms, and also an exaggerated activity of the factor limiting bacterial activity in ordinary soils.

These observations afford further evidence of competition among the soil organisms and indicate that some of the groups, and especially those which are fairly readily killed, are detrimental to the useful soil bacteria.

The effects of season and climate on the production of nitrate in the soil were discussed. It is notoriously difficult to generalise about seasonal effects, but, as a rule, the activity of micro-organisms is greatest in late spring and in autumn and lowest in winter and in dry summers.

The winter minimum is easily intelligible; the low temperature limits the activities of the organisms: in dry summer weather the moisture supply may be insufficient.

The spring maximum is the most interesting. It begins to show itself when the soil is drying after the cold and wetness of the winter, and when the sunny days first cause the temperature to rise. But it is the rain coming after warmth that causes the rush of life. Three factors seem to be involved. During winter the cold and the general unfavourable conditions have had their partially sterilising effect on the soil population, and also have resulted in a certain amount of disintegration of the soil organic matter. Everything is, therefore, ready for a great outburst of activity. A start is made as soon as the soil begins to dry and to become warm, but the dryness that favoured the warmth checks further development. Finally, all obstacles vanish when the warm rain comes, renewing the supply of water and the atmosphere containing the dissolved oxygen.

In consequence of these various actions the soil is left pretty rich in nitrate at the end of autumn provided the summer has been reasonably dry. If these remain they form a good supply for the young plants of the following season. But in a wet winter they are washed out and the young plant is deprived of some of its food. We thus have part of the explanation of the harmful effect of a wet winter, and one of the reasons why the husbandman in all ages has hoped for dry winters. "A fine winter," to quote from the *Georgics*, written over 2,000 years ago, "should be the farmers's prayer. From winter dust comes great joy to the corn, joy to the land." Again, the man of science has annotated the fact, and Sir William Shaw has worked out a mathematical expression showing how much damage is done on an average by winter rain.

From time to time it has been alleged that substances are produced in the soil harmful to bacteria. It is possible that something of this sort may occur in really sour, badly drained soils, but there is no evidence of their existence in normal soils.

There is, however, considerable evidence that the growing plant experts a depressing effect on the soil organisms. Rigid comparisons are not easy, but when the conditions on a fallow plot are made to approximate as closely as possible to those on a cropped plot it is found that there is more activity on the fallow plot.

It is not clear from the experiment, how the action takes place: whether the plant simply exercises some indirect effect on the temperature or moisture supply, or whether it directly influences the soil organisms. On the whole the evidence rather tends to indicate a direct action such as might be brought about by a poison given off from the root or left by the plant, or by the removal by the plant of some substances necessary for the bacteria.—*The Gardener's Chronicle.*

RUBBER.

Rubber, judging from recent messages, is in urgent demand in combatant countries at the present time; in Germany the shortage is stated to be acute. This is not unlikely, for, taking Austria and Germany together, the diminution in supplies since hostilities opened runs to 10,000 tons minimum. Fortunately for the industry there are larger requirements in other directions to avert any large drop in prices consequent on contracted demands in particular cases, and the South Indian plantations least of all have any reason for complaint, sales last year reaching the record total of 23,886 cwts., valued at Rs.72'98 lakhs. Belgium is taking little rubber at present and the chief purchaser of the South Indian product is, as in previous years, Great Britain. Rubber plantations in face of military requirements have a political as well as a commerical value at the present day. The South Indian plantations have in recent years come on hand over hand, and last year were able to send forward to Great Britain a contribution of considerable value, though whether the outcome will be the directing of attention to the full potentialities of South India as a rubber producing country we have, no doubt, yet to see.

One improvement in the position making for the success of South Indian plantations it is, perhaps, not too optimistic to calculate on, viz., a more regular and satisfactory labour supply. Millions sterling have been invested in rubber plantations in Malaya and Ceylon, and, so far as labour has been required, the drain for these has fallen on South India, to the detriment, it is not too much to say, of our own industry. In Assam, Government is organising a Labour Board; but in this Presidency planters have been forced to take the formation of labour organization into their own hands. The Madras emigration statistics for 1914 record a decrease in the number of passengers to the Straits Settlements during that period, partly due to the outbreak of the war in Europe resulting in the dislocation of the steamer service, but partly to the diminished demand for labour in the Malay rubber estates. But even in these discouraging circumstances the movement of labour to the Straits during the year did not fall below 49,028 men women, and children (3,558 children), and in 1913 the total was 117,783, of whom only 8,723 were children, representing a drain on that section of the population upon which our own South Indian plantations are most anxious, and most entitled, to draw. Burma took 79,757 against 130,725; and Ceylon, 144,146 against 190,059.

But to what purpose to argue? To jib against foreign emigration having been recognised as vain, planters are now seeing what potentialities of improvement lie in more efficient methods of recruiting. We are more than likely to see a clashing of twin stars when the Assam and South Indian Bureaus get to work, meanwhile the creation of these two organisations do not coincide, but the outcome will be the same, *viz* ., improved facilities for recruiting, and therefore, no doubt, a bigger supply of labour, and this is undoubtedly the plantations' greatest need.

Shareholders in rubber have faced many and varied fluctuations of fortune since the boom of 1910, and they might have been pardoned had they contemplated with feelings of some anxiety the outbreak of the European war, with all its unsettling influences—financial, transport, and commercial. In 1914 Germany took roughly 11 per cent. of the world's rubber production of 121,000 tons. Russia came next with nearly 12 per cent., Great Britain took 15 per cent., and the United States 40 per cent. The 121,000 tons came as to 72,000 tons from the plantation companies, 37,000 tons from Brazil, while the rest of the world accounted for

the other 12,000 tons, We are here concerned only with the fortunes of the South Indian industry. It is stated in the official report on the Presidency's sea-borne trade that our exports of raw rubber in 1914-15 showed a further expansion of 50 per cent, in quantity and 19 per cent, in value. The following figures for the last six years are given by the Collector of Customs to indicate the pace at which the industry has expanded :—

	Average price per pound.			
	Rs.	A.	Cwts.	Rs. lakhs.
1909-10 ...	4	10	276	1·95
1910-11 ...	5	2	1,414	8·13
1911-12 ...	4	3	4,866	22·98
1912-13 ...	4	2	8,888	40·78
1913-14 ...	3	7	15,959	61·31
1914-15 ...	2	12	23,886	72·98

The increase is attributed to a larger number of trees coming into bearing. The average value declined from Rs.384 to Rs.306 per hundredweight. Shipments to the United Kingdom rose from Rs.35·33 lakhs to Rs.51·63 lakhs, while those to Ceylon fell from Rs.25·54 to Rs.21·22 lakhs. The chief ports for the export of rubber are Cochin, Tuticorin and Calicut.

The promising outlook for the rubber industry is admitted, and the advice given to shareholders to hold on, provided they be in good companies, is thoroughly sound. As the "Economist" recently noted, the war wastage of horses, the wastage, too, of rubber tyres used on transport work, and the temporary restriction laid upon the purchase of the luxuries of the monied classes are three considerations for the optimist. "It was supposed upon the outbreak of war that many younger companies would be completely wiped out, in consequence of inability to obtain funds to prosecute development work, but in the majority of cases they have wisely agreed to stop fresh planting and to concentrate upon the production of rubber on the most economical scale possible. Nevertheless, some even of the older companies each as the Linggi and the United Serdang have but lately issued more shares, from which it may be inferred that many of the others, not in the front rank, are running short of capital. They will be helped, however, by the quiet expansion of demand for their product, and this should enable them to carry on without grave difficulty; moreover, as the price of the material hardens so will their situation become more easy. Many shares in the rubber market can be bought at the present time to pay a round 10 per cent. on the money; and if they can do this when the price of the material is standing at no extravagant level, they may tempt a speculative investor who likes to mix high-yielding shares with his better-class securities."

For the more important facts relating to the rubber companies—sterling and rupee—responsible for the increasing production of rubber in South India—we may turn to the figures issued by Messrs. Huson and Robinson, brokers, who have done useful service in getting together the available statistics. Unfortunately the returns are not quite complete. The list before me is dated June, at which date several reports had not been received, causing gaps in some of the crop estimates for the year 1915 and the cost per lb., but there is much useful information apart from this. —*Capital.*

ANTS.

Ants in Their Relation to Green Bug.

It is, I believe, universally held among Coffee Planters that the ants in Coffee Estates are the chief distributors of Green Bug, but I have not yet received a definite statement from any planter that he has seen any species of ant actually carrying the Green Bug from one tree to another. Experiments conducted in the Insectary in Bangalore during the past six months, which will be described in a bulletin to be published shortly, have shown conclusively, that several different species of ants do actually carry the green bug from infested to unifested trees and so are able to spread the infestation. This has for example been shown to be the case with the large red ant (*Occophylla smaragdina*) so common in Coffee Estates.

All recommendations with regard to keeping Green Bug under control therefore emphasize the necessity of destroying the ants as far as possible and this is, I believe, at present being done by the majority of planters. Where, as is the case with the large red ants, the nests are built in trees this is a comparatively simple affair but in the case of species which build their nests in the ground it is a much more difficult matter.

In a recent publication of the Java Experiment Station at Salatiga dealing with a certain species of ant in its relation to Green Bug, the author states that the Java Coffee Planters have devised an ingenious trap for catching the ants. This consists simply of a small section of bamboo closed at one end and open at the other. Such bamboo tubes are loosely filled with dry leaves, placed on the ground near coffee trees infested by green bug and covered up with leaves or grass. If this is done during the rainy season the ground ants of the particular species under discussion light upon these bamboo tubes as desirable places for nests with the result that workers, queens and pupae are found in them after two or three days. The pieces of bamboo are then plugged at the open end, gathered together and the ants killed.

In this connection it may be pointed out that the destruction of queen ants is the important thing for as is the case with white ants it it the queens which alone reproduce young so that any considerable destruction of queens would lead to a great diminution of the ants in an estate.

The particular species for which this trap has been used more or less successfully is a yellow species (*Plagiolepis longipes*) which is found in India and probably occurs on some of the Coffee Estates in Mysore. Whether such a trap could be used with equal success against other ground species remains to be investigated.

The author states that these ant traps can be used with success only during the rainy season as it is only when the ground is wet that the ants are likely to feel the need of seeking more comfortable quarters. Experiments in connection with their use are being undertaken by the Mysore Agricultural Department during the present season but the traps and their use are so simple and inexpensive that possibly some of the Coffee Planters in infested districts might like to try them also. In case any planters should try the traps, I should be extremely obliged if they would let me know what success they have achieved and should like at the same time to have the various species caught sent in to me for identification. This would be a very simple thing as the piece of bamboo could be simply plugged up, labelled and sent in by post as it is.

LESLIE C. COLEMAN.

Director of Agriculture in Mysore,

Bangalore.

CORRESPONDENCE.

Office of the Planting Expert,
Bangalore,
3rd July, 1915.

No. 704/1915.

THE EDITOR,

The Planters' Chronicle,
Bangalore.

Coffee Borer.

Sir,—I have much pleasure in enclosing, with the permission of the author, a very interesting letter on this subject for publication in your pages.

I cannot agree with Mr. Kent that scraping the stems is altogether useless in checking Borer. My experience is limited, but as far as it goes, I have found scraping and white washing of the stems of the bushes to act as both a repellant and an insecticide.

There is no doubt that much more might be known with advantage about the life history of this pest, and I hope this letter will induce others to write of their experience and knowledge.

The point Mr. Kent raises of the other food plants of the Borer besides Coffee is a most important one. Of the trees he mentions as being food-plants the "Tarië" is, I presume, *Terminalia belerica* and the "Whonnay," *Pterocarpus Marsupium*.

A question I would like to suggest is as to whether there is more than one species of Coffee Borer, and whether any species which attacks Coffee also lives in Bamboos?

Yours faithfully,
RUDOLPH. D. ANSTEAD,
Planting Expert.

Doddengooda,
Mudigere P. O.,
Kadur District,
July 25th, 1915.

Dear Anstead,—With you, I have been looking for some letters on "Coffee Borer" the in *Chronicle* for some weeks, but none have appeared. Like myself perhaps, many planters are shy of rushing into print, though most of us are deeply interested in Borer, especially those with young clearings. This pest has been unusually bad both last season and this, probably due to the drought of last year (there was absolute drought for 8 months in this locality, October to June, 1914). I have had a pretty good experience of Borer for 20 years and the last two seasons have been the worst I have known. Last year in a 30 acre clearing 2 years old, I took out 30 per cent of my plants, and this season again I have taken out the same amount though it is fairly shaded for the age. Dense shade is the only thing I have ever heard of that will keep down Borer and my old Coffee is free of this pest, though adjoining clearings are full. Scraping stems and maulishing is

often done in Coffee but seems to have little influence in checking Borer. I shall be glad to try the two whitewashes you mention in *Chronicle* page 366. Do you expect the whitewash to act as a contact-poison, or as a repellant and have you any reason for believing that it will check Borer? Tar and Kerosine have been mentioned, but I have seen both these kill out young coffee. A friend of mine once wanted to take out 50% of his coffee which was too close, he tarred a band round the plants to be left, these promptly died, fortunately before the remainder had been taken out, so he still had his 50% left. Last season in September—October, I put on a small gang of boys to search borer patches and try and catch the adult fly as you recommended, but after 2 or 3 days' hunting we gave it up as only 2 Borer fly had been caught. In May 1914 though, I had a very different experience at Lovett's place on the Baba Boodins. Lovett's house is in the coffee and he had put up a kutcher portico to his verandah, jungle posts and thatch roof. In the evening while sitting there under a lantern, Borer fly came in in numbers, Fremlin and I caught something over 100 in half an hour, and Fremlin had a similar experience at his brother's Bedogulie on the Billigo Rangams, and caught great numbers. Does it not look as if Borer fly was nocturnal? No one seems to know exactly what jungle trees, &c., Borer infests. I have often found coffee Borer in 'Tarie' and 'Whonnay' trees and once took 18 out of a Croton plant. Last month while removing Borer trees in a 3 year old clearing I found a large percentage looking shuck and the bark knotted and whorled showing every sign of Borer. On stumping these plants they were quite sound an inch or two above ground, and on opening the stems I found no Borer. *But* there was the small brown mark running round in and under the bark, but *not in the wood.* Evidently the grub had started, but not matured and died, this experience in new to me and must be the effect of some weather condition.

Yours sincerely,

(Signed) L. P. KENT.

Office of the Director of Agriculture
Mysore,
Bangalore, dated 4th August, 1915.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—Mr. Anstead has kindly shown me a copy of Mr. Kent's letter with his own remarks thereon. The Mysore Agricultural Department has recently taken up the investigation of Coffee Borer and it is of the utmost importance that we should obtain all the information possible so as to avoid wasting our time in following up wrong clues.

Mr. Kent's remarks with regard to the flight of the adult Borer beetle are extremely interesting. We have had the Borer under close observation for less than one year and the results of those observations have indicated that the September—October emergence of the beetle is much more important than the April—May one. In fact observations on very many estates all over the coffee area in Mysore have revealed only one or two adult beetles in May while the beetles were to be found in abundance last October. Mr. Kent's observations are of course, exactly the opposite of

these, but his remarks apply to the spring of 1914 while mine apply to that of 1915.

Now it is quite possible that the numerical importance of the two emergences may vary from year to year, *i.e.*, in some years more beetles may emerge in September—October and in others more may come out in April—May. It is also possible that there is really only one main brood in the year. (the autumn brood) and that only exceptionally do the beetles emerge in the spring. Mr. Kent's observations in the Bababudans in May, 1914 are opposed to this view, but I must note here that there are several different species of Borer beetles to be found in Coffee Estates which bear a striking resemblance to the coffee Borer but which are really distinct from it. Two such species have been recently taken from a dry Dalchini (*Cinnamomum Zeylanicum*) log in the Bababudans and a number of other closely related forms are known to occur in Southern India. Unfortunately we know practically nothing of the life history of these various forms, so it is impossible to say at present in just what trees the larvae breed.

It is of primary importance to ascertain (*a*) whether there are regularly two important broods of the Borer each year, (*b*) whether the coffee Borer attacks any other tree and (*c*) whether any other Borer attacks coffee (except of course, the well-known red Borer the larva of a moth, *Zeuzera coffeae*). The first is perhaps most important, because upon it will depend the decision as to when the Borer can be best attacked. Thus it would be useless to scrape and whitewash coffee trees in October if the chief emergence is in May and on the other hand a similar treatment in May will be quite useless if the majority of the beetles come out in October. Scraping alone appears to me likely to produce very little effect unless it happens to be done immediately after the greater part of the eggs have been laid. If the eggs have hatched before the scraping, the grub will almost certainly have penetrated sufficiently deeply to escape removal and if, on the other hand, the eggs have not yet been laid, the beetles are not likely to be deterred from ovipositing because a small amount of the outer bark has been removed. Whitewashing certainly appears to have much more in its favour and I propose to carry on during the coming autumn, a carfully controlled series of experiments on the use of this as well of other repellants which should enable to come to some definite conclusion on the subject.

With regard to the flight of the beetle, many if not most of the species belonging to this group do fly in the evenings or nights and a series of light trap experiments have also been planned for the coming autumn.

In conclusion I may say that I should be extremely obliged if planters would send me any specimens of beetles resembling coffee Borer, which they may find, especially if these have been taken just as they are about to emerge from the trees in their estates. Pupae taken from any kind of tree, stump or logs would also be gladly received as the adult beetles could probably be reared from them. On the other hand, the grubs themselves are practically useless for identification as in our present state of knowledge it is impossible to identify the insect in this stage and the grubs themselves almost invariably die without pupating. I shall of course, gladly arrange for the identification of all such material if sent in.

Yours faithfully,

LESLIE C. COLEMAN,

Director of Agriculture.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 33.] AUGUST 14, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

EXPLOSIVES.

The Use of Cotton for the Production of Explosives.

The history of the laboratory production of various forms of nitro-cellulose has been well stated by many chemists and everything essential can be found either in their own researches or in the ordinary text-books. The practical outcome of such work has been the establishment of modes of manufacture for many purposes, but in the present instance it is proposed to deal entirely with the use of cellulose in one shape or another for explosives of any practicable kind. It is almost unnecessary to state here that every kind of propulsive explosive now used has cellulose as its basis, but it may not be superfluous to say that all military propulsive explosives have cotton for their basis as distinct from cellulose.

The word cellulose must not be understood in the strict chemical sense, but rather as including all those materials which are chiefly cellulose, and this definition will include materials like wood-pulp. Now one may clear the ground on this subject at once by saying that, for military purposes, wood-pulp and other impure forms of cellulose are useless. Very good sporting powder can be made from nitrated wood-pulp, but the artillerist would be in great difficulty if he were provided with such a propellant, because in order to obtain any sort of regularity the nitration of the wood-pulp has to be kept at a low point, and the ballistics on which the artillerist depends would be quite thrown out. The modern gun is really a machine of precision; the artillerist knows that and expects it to throw one shot after another to reach the same point within a fraction of its possible range as computed from its elevation of sighting, and his whole attention has been based on this. If he were supplied with a material, however good, which on explosion developed a lower pressure, he would be relatively helpless and his rivals, using their own standard material, would have him at a sore disadvantage.

In modern practice, the raw material used is cotton waste, which is, as its name implies merely the rejected stuff in the manufacture of cotton goods; and although linters, which is the technical term for the short fibre material adhering to the cottton seed, may be used, yet its employment presents serious difficulties in that the seed with which it is associated has to be removed by chemical treatment. There have been many experiments made to use such substances as jute, ramie, kapok fibre, and in short every-

thing from sulphite pulp to spun cotton, but as workable substances these have been rejected in favour of the staple material—cotton waste.

The method of producing a satisfactory form of nitro-cellulose from cotton waste is as follows:—The waste is hand-picked so as to remove the grosser impurities. The product is teased, picked once more, and then dried. After that, the nitration process is carried out, and this has been much modified in the light of experience, but in essence still consists in the immersion of the purified waste in a mixture of nitric and sulphuric acids of the following composition: H_2SO_4, 71 per cent.: HNO_3, 21 per cent.; H_2O, 8 per cent. The amount of water in this mixture is important, and the acids as they are written are as their formulae represent and do not refer to the commercial products. The strict relationship of the water to the two active materials should be preserved. It is of course easy now to obtain sulphuric anhydride (SO_3) and make an anhydrous mixture, but this gives a nitro-cellulose with too high a nitrogen content. After the mixed acids have acted for the required time, they are removed and and the gun-cotton is washed to remove as much of the acid as possible, and purified by several boilings with water. The boiling with water is of great importance, as in this part of the process the unstable bodies produced during nitration are dissolved or decomposed, leaving the nitro-cellulose in a stable condition. The only thing now remaining is to pulp the cotton, which is again washed and then partly dried and moulded into the required shape by pressure,

The old idea that something as nearly as possible to the so-called hexa-nitrate of cellulose should be aimed at has been fairly well exploded, and the manufacturer seeks to regularise his output so that he may obtain a nitro-cellulose with approximately 11 molecules of NO_3 to the quadruple molecule, as shown in the formula $C_{24}\ H_{29}O_9(NO_3)_{11}$. This formula must not, however, be taken as any more than a convenient way of expressing the degree of nitration, which is really better stated in terms of content of nitrogen which ranges between 12·93 and 13·05. This is merely a parenthesis, but is necessary as showing how delicate and complicated a matter it is to obtain a uniform and trustworthy material for propulsive explosives, and as it has been found in practice that even what is apparently such a simple matter as the preparation of a mixture of acids of known composition is really one requiring some care and skill. It will be readily understood that the difficulty is trifling compared with that of providing an equally regular form of cellulose. So well is this recognised that different consignments of cotton waste, all of approved quality, all picked, teased and re-pricked, are mixed so that the cellulosic raw material may be as nearly the same grade as possible.

With this fact in front of us, let us consider what the condition of a factory would be which had to use any kind of raw material, clean or dirty, lignified or not, and had to try to make that into a trustworthy propulsive explosive of standard quality. This question has only to be asked for the answer to provide itself. In the present case a great deal too much has been assumed as to the capability of our enemies for making trustworthy nitro-cellulose without cotton waste. Because any competent chemist in his laboratory could make some form of nitro-cellulose from his own shirt cuffs if he pleases, people have jumped to the conclusion that that will be of some use to the artillerist. The fact that the manufacturing process of an explosive like this is of the most delicate kind and has to be conducted with military precision, has been constantly overlooked; and at the present moment it is not too much to say that there is only one material available for modern gunnery, and that is cotton.—*Nature.*

LABOUR.

Indian Indentured Labour in our Colonies.

By Sir Henry Cotton, K.C.S.I.

Two years ago, Mr. James McNeill and Mr. Chimman Lal were deputed by the Indian Government to enquire into the conditions of Indian indentured labour in Trinidad, British Guiana, Surinam, Jamaica and Fiji. Their report has now been presented to Parliament, and if I could possibly have praised it, I would have done so. The two large volumes of which it consists are a monument to the industry of their compilers. But when I have said this I can add no more. The report is overwhelmed with a vast mass of detail which it was unnecessary to record; it bristles with statements and figures which are of no real utility; and on the other hand, it omits or slurs over perfunctorily the most vital facts and information which were within the writer's possession, but of which, apparently, they entirely failed to realise the importance.

I would defy anyone to read this report without a sense of bewilderment. It may be gathered in a general way that indentured labourers are fairly well paid and well-to-do, that their tasks are tolerably easy, and that their health is carefully, though not always effectually, looked after by their employers. But there was really very little need for enquiry into these points, which have never been seriously disputed. It is evident that the number of criminal prosecutions for petty offences is everywhere excessive, that the Magistrates are machines for sending men to prison, and that the duties of the Protector of immigrants are inadequately discharged; but under these heads it is doubtful whether any information is elicited, which is not already contained in the report of the Royal Commission presided over by Lord Sanderson. One may learn, also, though one has to dig and delve to find it, that the social conditions of life among indentured labourers are simply detestable and horrible, and that, when all other considerations as to the welfare of the immigrants are winnowed away into comparative insignificance, this one question stands out pre-eminent in a manner which can no longer be ignored. There is, however, no such pre-eminence accorded to it by Mr. McNeill and Mr. Chimman Lal, and that is the most surprising and disappointing feature of their report.

The Disparity of the Sexes.

A former Chief Commissioner of Assam—it was not I—once described the condition of coolies on a tea estate as that of beasts in a managerie. He was referring rather to their moral than to their physical condition; but whether the remark is justly applicable to tea coolies or not, there can be little doubt that it does apply to the Indian immigrant coolies in our sugar-growing colonies. Mr. McNeill and Mr. Chimman Lal are, of course, careful not to go so far, but this is what they do say of indentured women:

> The women who come out consist as to one-third of married women who accompany their husbands, the remainder being mostly widows and women who have run away from their husbands or been put away by them. A small percentage are ordinary prostitutes. Of the women who emigrate otherwise than with their husbands and parents the great majority are not, as they are frequently represented to be, shamelessly immoral. They are women who have got into trouble and apparently emigrate to escape from the life of promiscuous prostitution which seems to be the alternative to emigration. . . . What appears to be true as regards a substantial number is that they ran away from home alone or accompanied by some

one by whom they were abandoned. that they drifted into one of the large recruiting centres and, after a time, were picked up by the recruiter.

If this be true of the source of supply, we can hardly expect to find that the condition of the woman is materially improved on the plantation. The Commissioners write :

As regards immorality on estates, we have already stated that the majority of women are not married to the men with whom they co-habit. Of these unmarried women a few live as prostitutes, whether nominally under the protection of a man or not. The majority remain with the man with whom they form an irregular union. They are, however, exposed to a good deal of temptation as there are on all estates a number of young unmarried men.

In point of fact this guarded language, grave as it is, very imperfectly reveals the actual situation. Apart from all other explanation, the root cause of the appalling sexual immorality which prevails in every colony is the overwhelming preponderance of adult males to adult females among indentured immigrants. The Commissioners know this very well, but they touched on this point only to evade it, and I search the 334 pages of their report in vain for precise figures. Fortunately they are to be found in a return which was presented to Parliament by the Colonial Office in March, 1914 (Cd. 7622). From this return we learn that in Trinidad and Tobago the number of adult males is 31,989, and of adult females 17.159 ; in British Guiana the number is 53,083 to 34,779 ; in Jamaica it is 7,137 to 4,775 ; and in the Fiji Islands it is 20,062 to 8,785.

The mere statement of these figures is sufficient ; and it must be remembered that these immigrants are ignorant and low-class people who live together on crowded plantations in colonies many thousand miles away from their homes, and that unmarried men are absolutely unable to find wives or associates outside their own race. Mr. McNeill and Mr. Chimman Lal may truly say that the women who emigrate do so " to escape from the life of promicuous prosititution which seems to be the alternative to emigration," but it would have been more true and appropriate if they had the courage to add that promiscuous concubinage was the only possible condition of life which awaits them after emigration.

The Result in Fiji.

What follows ? I will take only one colony, that of the Islands of Fiji, which is undoubtedly the worst in regard to the disparity of the sexes. The attention of the Commissioners does not seem to have been particularly drawn to the number of a case of violent crime which are due to marital jealousy. They allude to it parenthetically, but give no statistics. I do not know how many cases of grievous hurt, homicide, and murder are annually to be attributed to this cause. But I do know that an extraordinary number of persons are annually sentenced to capital punishment in Fiji, and that the proportion of executions to population is larger in these Islands than in any other place within His Majest's dominions. And I know also that most of these cases are among Indian immigrants, and that the cause of crime is that which I have indicated.

I do not forget that when this question was directly raised by the late Mr. Pointer in the House of Commons as long ago as April 28th, 1914, the Secretary of State for the Colonies replied that its consideration was postponed pending the receipt of Mr. McNeill and Mr. Chimman Lal's report.

There is the less excuse therefore, for these gentlemen in passing it over without investigation. They do, however, enquire into the frequency of suicides among immigrants, and it will hardly be credited when I say that the number of suicides in Fiji during 1912, which is the latest year for which the Commissioners report, amounts to one in every 853 of indentured immigrants. In the province of Madras, from which most of these unfortunates are said to come, the ratio of suicides in 1908, the latest year for which comparative statistics are given, was one in 22,873. That is a sufficiently startling figure in itself, but it is nothing when compared to the state of things disclosed in Fiji. The Commissioners observe that the greatest number of these suicides are due to "domestic quarrels and jealousy." They do not say how many of these suicides were men and how many women, and do not appear to have realised how relevant detailed information of this kind would have been to the objects of their enquiry.

The present rule requires that for every 100 male adult immigrants 40 women over ten years of age should be shipped. The Commissioners propose that there should be no minimum limit of age, and that the percentage of females to males should be raised to 50. Was there ever put forward a more inadequate remedy for a gigantic evil? They observe that "an increase to 100 per cent., may seem at first suitable, but that this becomes less attractive on consideration," and that "unless women emigrated as wives, insistence on a parity between the sexes would be anything but a gain to morality." I confess I do not follow this argument, for the relationship of one man to one woman, even though no marriage takes place appears to me a more moral arrangement than the sort of polyandry which now prevails. But why not suggest that only married couples should be accepted? I suppose that the answer to this would be that the task of recruiters would become an impossible one.

The Only Remedy.

If so, the whole system of recruiting stands condemned. The truth is, however, that indentured labour itself, within the confines of India and to distant colonies alike, is no longer defensible. It is no longer in the experimental stage, for it has gone on for more than fifty years. We are only too ready to blind our eyes to the inherent evil which accompanies it. With all the experience we have had, we are unable to eradicate that evil, and the only effectual remedy is to put a stop to indentured labour altogether.

Indian educated opinion has long been agreed on this point; the policy of Government is, I think, tending in this direction, and certain we may be that Commissions and Reports, and half way measures, such as this Report suggests, will avail nothing in permanently bolstering up methods which every instinct of morality rejects—*India*.

STRAITS SETTLEMENTS.

Rubber Exports, May, 1915.

According to telegraphic information received by the Malay States Information Agency, the exports of rubber from the Straits Settlements for the month of May amounted to 3,588 tons, as compared with 1,978 tons in April and 1,309 tons in May, 1914. (These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, Sumatra and the Non-Federated Malay States.)—***The Board of Trade Journal.***

MEMBERS OF DISTRICT ASSOCIATIONS WHO HAVE JOINED THE ARMY.

ANAMALAI PLANTERS' ASSOCIATION.

R. Breiley, I. A. R. O.
S. W. Hoole. 2nd Lt., Oxford and Bucks, Light Infantry. Now in France.
E. Pruen, Corporal, Motor Cycle Despatch Rider. Now in France.
H. Robinsion, I. A. R. O.

COORG PLANTERS' ASSOCIATION.

2nd Lieut. Trevor Bracken, 13th Rajputs, E. Africa.
2nd Lieut. H. A. Bradshaw, 1st Lancs. (?) Peshawar.
2nd Lieut. C. E. M. Browne, ———— , Jhelum.
W. E. Dickinson, Ambulance, France.
Captain W. Egerton, Censor, France.
2nd Lieut. J. A. Graham, Lincolns Battalion. Now in France.
Captain A. S. L. Grove, Lincolns. Now in France.
Enlisted. H. J. C. Hamond, L. N. Lancs., E. Africa.
D. Rider, J. A. L. Hewer, R. E., France.
Enlisted. J. B. Houchen, L. N. Lancs., E. Africa.
2nd Lieut. Howard Jackson, S. and T., Persian Gulf.
2nd Lieut. C. Legard, Lincolns, Battalion now in France.
2nd Lieut. D. Macdougal, S. and T., Egypt.
Enlisted. J. S. H. Morgan, L. N. Lancs., E. Africa.
Enlisted. A. E. J. Nicolls, L. N. Lancs., E. Africa.
2nd Lieut. G. D. Pechell, 108th Infantry, Bombay.
Enlisted. C. A. Reid, L. N. Lancs., ————
2nd Lieut. H. L. Robinson, ———— . Meerut.
2nd Lieut. W. P. Rogers, ————, Nowgong.
2nd Lieut. A. H. Sheldrick. 8th Cavalry, Jhansi.
R. P. M. Tipping, North Staffords, Gharial.
J. S. Trelawney, Remount, England.
R. Trelawney, O. T. Corps, England.
2nd Lieut. J. C. S. West, ————. ————

In addition to this a good many youngsters of Coorg parentage have joined at home. Jackson 2 sons, Robinson 2. Shaw 2. Gerrard 1. Trelawney 1.

It is interesting to note that Messrs. Grove, Graham and Legard are all in the same Battalion—all 3 being North Coorg Planters.

Corrections.

KANAN DEVAN PLANTERS' ASSOCIATION.

W. J. Dixson (not Dixon), Corporal, 2nd King Edward's Horse which is now attached to the First Canadian *Cavalry* Brigade not "*mounted*" Brigade.

H. Berry Hart was attached to 113th Infantry, Allahabad, but is now in France.

NILGIRI PLANTERS' ASSOCIATION.

F. G. Lechler, 2nd Lieut., is attached to the 26th Punjabis, stationed at Bannu (N. W. F. P.) and now in charge of the chain of forts over the Border.

WEST COAST PLANTERS' ASSOCIATION.

It is R. E. Haslam, of Peermade, and (not W. G. Haslam), who has gone to France and was formerly attached 26th Cavalry.

L. Bell Syer, 27th Punjabis, Delhi, now gone to Persia.

H. Walmesley, now training at Quetta.

R. Lescher was attached to 52nd Sikhs, Bannu, but owing to injuries to foot has been obliged to resign.

RUBBER TRADE ASSOCIATION OF LONDON.

MONTHLY STATISTICS,

No. 3.

IMPORTS of all kinds of Rubber into the United Kingdom.

From	June. 1915.	June. 1914.*	June. 1913.*	Six Months ended June. 1915.	Six Months ended June. 1914.*	Six Months ended June. 1913.*
Straits Settlements and Federated Malay States ...	3,152	1,848	1,718	23,468	14,507	11,759
Ceylon ...	652	430	352	7,932	3,567	2,725
British India ...	30	—	—	766	—	—
Dutch East Indies ...	323	—	—	1,293	—	—
Brazil and Peru ...	1,086	919	943	8,090	8,972	11,229
Africa ...	477	41	121	1,841	401	1,315
Other Countries ...	318	1,203	1,630	1,093	8,134	9,459
Total Tons ...	6,038	4,441	4,764	44,483	35,581	36,487

EXPORTS of all kinds of Rubber from the United Kingdom.

To	June. 1915.	June. 1914.*	June. 1913.*	Six Months ended June. 1915.	Six Months ended June. 1914.*	Six Months ended June. 1913.*
Russia ...	1,667	283	517	6,238	3,756	3,538
Germany ...	—	1,098	941	—	5,609	5,620
Belgium ...	—	168	158	—	1,179	991
France ...	404	663	420	3,217	3,578	2,408
United States ...	3,068	1,943	1,354	21,757	13,034	7,904
Other Countries ...	737	358	340	4,362	2,079	1,930
Total Tons...	5,876	4,513	3,730	35,574	29,235	22,391

* Including Waste and Reclaimed Rubber.

IMPORTS, DELIVERIES AND STOCKS in London and Liverpool, June, 1915.

		Imports. For June	Deliveries. For June	Stocks 30th June. 1915.	Stocks 30th June. 1914.	Stocks 30th June. 1913.
London	Plantation ...	4,699	5,469	5,758	3,052	2,869
	Other kinds ...	46	70	543	726	1,011
	Total Tons ...	4,745	5,539	6,301	3,778	3,880
Liverpool	Para ...	974	833	1,323	810	1,336
	Other kinds ...	586	448	624	1,096	1,326
	Total Tons ...	1,560	1,281	1,947	1,906	2,662
Total Tons for London & Liverpool ...		6,305	6,820	8,248	5,684	6,542

SHIPMENTS FROM STRAITS SETTLEMENTS AND F. M. S.

	May.			Five Months ended May.		
	1915.	1914.	1913.	1915.	1914.	1913.
Tons ...	6,396	3,378	2,039	29,247	18,606	12,477

SHIPMENTS FROM CEYLON.

To	*May.	Five Months ended May. 1915.	1914.	1913.	1912.
United Kingdom	698				
Russia	30				
Germany	—				
Belgium	—				
France	16				
U. S. A.	872	7,623	5,878	3,980	1,991
Other Countries	38				
Total Tons...	1,654				

* Figures made up to May 31st.

U. S. A. IMPORTS AND EXPORTS.

	April.			Four Months ended April.		
IMPORTS.	1915.	1914.	1913.	1915.	1914.	1913.
India rubber ...	9,118	7,429	3,955	31,201	22,473	18,915
Gutta and Balata ...	1,617	1,159	1,908	4,570	4,094	8,009
Total Tons...	10,735	8,588	5,863	35,771	26,567	26,924
EXPORTS.						
India rubber ...	166	196	181	981	671	854
Gutta and Balata ...	27	2	—	191	30	32
Total Tons...	193	198	181	1,172	701	886

PARA RECEIPTS.

	June, 1915.	July, 1914 to May, 1915.	Total Crop.
Rubber ...	1,675	27,448	29,123
Caucho Ball ...	650	5,562	6,212
	June, 1914.	July, 1913 to May, 1914.	
Rubber ...	1,090	28,060	29,150
Caucho Ball ...	880	8,950	9,830

	June, 1915.
Shipments to U. S. A. ...	380 tons
„ Europe ...	490 „
	870

6, MINCING LANE,
10th July, 1915.

THE UNITED PLANTERS' ASSOCIATION OF SOUTHERN INDIA—(INCORPORATED).

LABOUR DEPARTMENT.

Income and Expenditure Account to 30th June 1915.

Dr. **Cr.**

	Rs.	A.	P.	Rs.	A.	P.		Rs.	A.	P.	Rs.	A.	P.
To Expenditure Head Office and Circles ...	1,22,801	4	11				By Subscriptions ...	1,96,236	4	0			
„ Depreciation on Furniture	156	3	0				„ Interest allowed by Bank ...	502	7	6			
„ Balance to Balance Sheet	73,781	3	7								1,96,738	11	6
				1,96,738	11	6							
Total Rs...	...			1,96,738	11	6	Total Rs....	...			1,96,738	11	6

Balance Sheet, 30th June, 1915.

LIABILITIES.	Rs.	A.	P.	Rs.	A.	P.	ASSETS.	Rs.	A.	P.	Rs.	A.	P.
Cash with Dy. Director, Coimbatore Division ...	564	7	9				Furniture at Head Office ...	1,562	1	0			
,, Supdt., Srivilliputtur Division ...	29	10	7				Less Depreciation @ 10% ...	156	3	0			
,, Supdt., Nagercoil Division ...	52	4	11								1,405	14	0
				646	7	3	Stock at Head Office ...	.....			410	7	0
Security Deposit ...	.....			500	0	0	Outstandings—						
Rent & Salaries for June, 1915 ...	.....			523	9	8	Subscriptions unpaid ...	22,480	15	6			
							Director, Labour Department...	2,243	13	9			
							Due by Estates ...	108	0	0			
							Advances to Staff ...	832	0	0			
							Cash—				25,664	13	3
							At the Bank of Madras, Madras,	7,914	4	3			
							,, the Mercantile Bank of India, (Limited) ...	36,370	12	9			
Balance of Income and Expenditure account ...	.....			73,781	3	7	,, Head Office ...	211	12	11			
							With Supdt., Villupuram Division.	1,705	7	3			
							,, ,, South Canara ,, ...	385	13	4			
							,, Asst. Supdt., Markapur ,, ...	314	1	0			
							,, ,, ,, Bellary ,, ...	567	14	9			
											47,470	2	3
							Security Deposited at Bank of Madras, Bangalore ...	.....			500	0	0
Total Rupees...	.....			75,451	4	6	Total Rupees...	.....			75,451	4	6

I hereby certify that I have examined the above Balance Sheet with the Statements submitted by Superintendents and the Books and vouchers at the Head Office relating thereto, and in my opinion the Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Departments affairs according to the best of my information and the explanation given me, and as shown by the books of the Department.

Bangalore, 4th August, 1915. (Sd.) W. H. HALDWELL, *Auditor*. (Sd.) AYLMER Ff. MARTIN, *Director*.

Missing NO 34

Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 35.] AUGUST 28, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

A Memo. of the Resolutions passed at the last Annual General Meeting is published. There are twenty-seven in number.

The interesting lecture delivered by Mr. Anstead, Planting Expert and Scientific Officer, at the Annual General Meeting, on Fertilisers is published. It emphasises once again the value of analysis of all manures, guaranteed or otherwise and planters themselves can work out the cost from the tables given. As regards Fish Manure the practical conclusion at which he arrives is, that the purchase of Fish guano at a higher price is more valuable than ordinary Fish Manure so long as no guarantee of sand content is given. Poonacs and potashes are dealt with and many valuable suggestions given.

The Report of the first year's working of the Labour Department is published and must be considered very satisfactory by all subscribers. The value of the Department is everywhere being felt, and its influence becoming more widespread. We specially call attention to the paras, on page 433 and 444, and should be worn as a frontlet by every subscriber, and should be taken to heart by everyone interested in our industries. Combination and co-operation are the watchwords of the Department.

We publish from the *Queensland Agricultural Journal* "Science *versus* Routine" which will be read with interest.

The Manager of the Mercantile Bank of India, Limited, advises us that a Branch of their Bank has been opened at Shanghai in place of the Agency they had there hitherto.

We publish the first list of Subscriptions to the South India Planters' War Fund which was handsomely supported by the Delegates present, and confidently hope that it will be equally well supported by all members of the Planting Community.

We regret that by an error Mrs. Day's name appeared amongst the names of visitors on the opening day instead of that of Mrs. Guy Turner.

Honorary Secretaries are specially requested to keep the Secretary, U. P. A. S. I., informed of the addition and corrections of their members who have gone to the Front.

MEMO. OF RESOLUTIONS.

FINANCE.

1. That the last year's accounts be adopted.—Carried.

BUDGET, 1915-16.

2. That the Budget for 1915-1916 as laid on the lable be adopted.—Carried.

REPORT OF SCIENTIFIC DEPARTMENT COMMITTEE.

3. That the Report of the Scientific Department Committee be considered.—Carried.

4. That the Report of the Scientific Committee be adopted and that the location of Experimental Stations be left to the decision of the Committee and that we put on record our appreciation of the offer made to us by the Government of Madras and a vote of thanks to the Committee for their services.—Carried.

EUROPEAN ASSOCIATION.

5. That we pass a resolution agreeing with the policy of the European Association and would suggest that all members of our Community give effect to this resolution by becoming members of the European Association and recommend Mr. Earle Welby's letter be published in our Book of Proceedings.—Carried.

YERCAUD-GLAZEBROOK ROAD.

6. That the U. P. A. S. I. do strongly urge on the Government of Madras the great necessity of connecting the Yercaud-Glazebrook Road with the top of the Manjavadi Bridlepath, and the linking up of the Manjavadi Bridlepath with the Salem-Harur Cart Road in the plains.—Carried.

POSTAL COMMUNICATIONS.

7. That owing to the representations of the South Mysore Association having no effect on Postal communications in the Hassan and Kadur Districts this Association requests the Postmaster-General to have more drastic steps taken for its improvement.—Carried.

COCHIN HARBOUR.

8. That this Association is strongly in favour of the construction of a harbour at Cochin, which would be open throughout the year, and that Government be asked to continue dredging operations at once so that the feasibility or otherwise of the improving scheme may be definitely settled at an early date.—Carried.

RAILWAYS IN PLANTING DISTRICT.

9. That this Association strongly advocates the proposed Shoranur-Wynaad Railway Scheme and that Government be asked to proceed with the survey of the line as soon as possible.—Carried.

10. That the Wynaad Resolution be supported and further that the Mysore Dubar be urged to carry out their proposed project with regard to Bautkull or other suitable port on the West Coast, and by this means link up the two ports of Cochin and Bautkull, giving equal facilities to the Planting Districts along the line.—Carried.

VAIGAY VALLEY RAILWAY.

11. That this Association respectfully urges upon Government and upon the District Board of Madura that a very early start be made with the construction of the Vaigay Valley Railway.—Carried.

SCIENTIFIC DEPARTMENT.

12. That the present Committee continue as executive, and in conjunction with Honorary Secretaries of District Associations arrange sites of proposed experimental stations and other details of the reorganisation of the Scientific Department U. P. A.—Carried.

PESTS AND DISEASES.

13. That in view of the correspondence from Government we have just had read to us we are glad to hear the matter is being taken up, and that our Planting Member be asked to keep us advised on the subject.—Carried.

BEES AND POLLINATION.

14. That the Government of Madras be thanked for the interest they have taken in the subject of Bees and their effect upon the Pollination of Coffee, and that the District Associations concerned be asked to co-operate in the matter with the Forest Department along the lines suggested by Mr. C. D. MacCarthy as recommended in G. O. No. 3588 of December, 1914.—Carried.

TRANSPORT OF TEA SEED.

15. That this Association continue to approach the Railway Companies asking them to take more care over the Transport of Tea Seed to ensure prompt delivery at the correct destination, and that the various railways concerned be asked to include Tea Seed in their Schedule of perishable articles.—Carried.

FREIGHTS.

16. That this Meeting take every possible step to secure a reduction of and more regular freights for Tea, Coffee, Rubber and other products from S. India, specially invoking the assistance of the Chamber of Commerce in Madras, Tuticorin, East and West Coast ports.—Carried.

RUBBER GROWERS' ASSOCIATION.

17. That a local Committee in Southern India of the Rubber Growers' Association as outlined in their letter of 11th December last be formed as early as possible.

(*a*) The Committee to consist of about 8 Planting and 4 Mercantile members, the Chairman and Secretary of the U. P. A. S. I., to be members ex-officio, the latter to act as Secretary until other arrangements be made.

(*b*) That the Combined Travancore Planters' Association be asked to allow this Branch of the R. G. A. to be worked in conjunction with their business and Meetings.

(*c*) The following gentlemen to be asked to serve on the Committee as Mercantile Members—Representatives of Messrs. Aspinwall & Co., Cochin, Messrs. Darragh, Small & Co., Alleppy and Messrs. Peirce, Leslie & Co., of Calicut. As Planting Members a representative to be nominated by the members of each of the Mundakayam, West Coast, South Travancore, Coorg, Anamalai, and Shevaroy Planters' Associations, with power to add to their number.—Carried.

LABOUR DEPARTMENT CONTROL COMMITTEE.

18. That in the event of the Chairman of the U. P. A. S. I., not being a subscriber to the Labour Department he shall not be a member of the Control Committee, and that the Association be empowered to appoint a subscriber to fill the vacancy on the Control Committee and the Committee be empowered to appoint its own Chairman.—Carried.

19. That the matter having been thoroughly ventilated and Mr. Day's position made satisfactorily clear to the mind of the meeting, the matter be allowed to drop, and the discussion kept in Comittee.—Carried.

NON-SERVICE OF WARRANTS.

20. That the Secretary be instructed to invite the co-operation of the Planting Member to get the Government to arrange for a visiting Magistrate periodically to the Anamalai Hills, for the purpose of issuing warrants and trying cases under Act XIII of 1859.—Carried.

ALIEN ENEMIES.

21. That this Association do support the action already taken in the matter of alien enemies by the Madras Chamber of Commerce and the European Association.—Carried,

THE PLANTERS' BENEVOLENT FUND.

22. That a powerful appeal be drawn up by the Secretary and sent to Honorary Secretaries of District Associations for distribution among eligible members of our Community, together with a request to all such Honorary Secretaries to push the interests of the Fund to the best of their ability.—Carried.

A PLANTERS' WAR FUND.

23. That a Fund, to be known as 'The South Indian Planters' War Fund,' be established, for the purpose of helping, when required, planters who have joined His Majesty's Forces, it being understood that the word 'planter' in this Resolution covers employees of mercantile firms belonging to District Associations.

24. That our representative on the London Chamber of Commerce be asked to kindly act as Treasurer of the South India Planters' War Fund in London; and that the following gentlemen be asked to act on the Committee of the Fund:—Messrs. Acworth. Macrae, Romilly, Hodgson, Harris, Bannatine and H. M. Knight.—Carried.

25. That the Executive of the Benevolent Fund be asked to act as Treasurers in India aad that a separate banking account be opened for the War Fund.—Carried.

AN AEROPLANE PROPOSAL.

26. That this Meeting approves co-operation with the Overseas Club in view to supplying aircraft for the War and would ask the Executive Committee of the U. P. A. to assist the planting districts by receiving and forwarding subscription as collected.—Carried.

AUDITOR.

27. That no Auditor be appointed at this meeting but the purpose of putting the accounts on a more satisfactory basis the Executive Committee be authorised to make such arrangements as may be considered necessary.—Carried.

FERTILISERS

Lecture delivered at the twenty-second Annual Meeting of the U. P. A. S. I., on 18th August, 1915.

BY

RUDOLPH. D. ANSTEAD, M.A.,

Planting Expert Agricultural Department, Madras, Scientific Officer, United Planters' Association of Southern India.

At the last Annual Meeting of this Association which I had the pleasure of attending, in 1913, a Resolution was passed asking the suppliers to guarantee that Fish Manure should not contain more than 5 per cent. of insoluble matter.

The replies received from the Firms were of an unsatisfactory nature and most of them said that what was asked for was impossible. Fish Manure was prepared in such a way on the coast that it become impregnated with sand and any measures adopted to avoid this would raise its cost price considerably, and so on. That no great improvement has taken place since that Meeting is probable since the only sample I have had in my laboratory since my return contained 31·78 per cent,, of insoluble matter and only 4·61 of Nitrogen. That it is impossible to prepare purer fish manures at a very little enhancement in price, I am not convinced and I hope at this Meeting to hear Messrs. Parry & Co's. representative and the representatives of other Firms on the subject.

I have had some correspondence on the subject placed in my hands in which it was stated by a supplier that he could not understand that it made much difference to the planter how much Sand was present in the Fish so long as he paid a fair price for the Nitrogen and Phosphoric Acid, and there was a tendency to imply that the Planting Expert was making an unnecessary fuss about the matter.

That it does matter and exactly how much it matters I will try and show you. Were this argument true no one would buy Nitrogen in the form of Fish at all, but always in the form of concentrated mineral fertilisers. Organic manures are bought, not solely on account of their Nitrogen content but because they consist of a large bulk of Organic matter which, as it gradually decomposes under the influence of bacteria, supplies Nitrogen and Phosphoric Acid to the crop. This organic matter has a decided value of its own, adding humus to the soil, and improving its physical condition as well as supplying food for the soil bacteria which recent researches have shown to be so valuable to the welfare of the crop. Consequently when a manure like Fish is bought, organic matter is wanted and not Sand, organic matter which is a potential supplier of Nitrogen and other plantfood. Now it is obvious that the more sand a given sample of Fish manure contains the less organic matter it will contain, however rich in Nitrogen that organic matter may be. It is for this reason that when an analyst gives you an analysis of Fish manure one of the items he returns is 'Organic Matter,' and in considering the value of any sample of organic manure as judged from its analysis this is a figure to be looked at.

In the case of Fish Manure it is largely a question of cost of transport. When this is small, near the coast and near the railway, no doubt it pays to buy low grade fish as a fertiliser. Indeed, it has been found by the Madras Agricultural Department that this is so in the case of the ryot. But when

estates are situated far from the source of supply and the cost of transport is Rs.15—20 per ton, as is often the case with many planters, the question is of a different nature.

When the cost of transport is Rs.11-10-6, per ton it amounts to one pie per lb. and this is a low figure for the average estate at the top of the ghats. In the case of the sample of Fish manure quoted before which contained 32% of sand, in every ton there was 717 lbs. of this useless material, and this cost at the above rate Rs.3-11-9 to transport to the estate. This might have been spent in carrying more profitable material.

The practical conclusion I have reached is that in the case Fish it pays the planters as a general rule to buy Fish Guano at a higher price rather than ordinary Fish manure so long as no guarantee of sand content is given.

Fish Guano can be obtained at Rs 95 per ton, guaranteed to contain 8% of Nitrogen and 9% of Phosphoric Acid and it often contains more than this. Now suppose for the sake of example one has Rs.1,000 to spend, cost of transport being Rs.15 per ton ; we get the following comparative figures :—

Manure purchased	Fish Guano. N—8% P_2O_5—9%	Fish Manure. N—4·6% P_2O_5—6·3%
@	Rs.95 per ton	Rs.50 per ton
Quantity purchased	9 tons	15 tons 6 cwts.
Costing	Rs.855	Rs.765
Cost of Transport @ Rs.15 per ton	Rs.135	Rs.229-8-0
Total cost on Estate	Rs.990	Rs.994-8-0
Plant food purchased—		
Nitrogen	1,611 lbs.	1,575 lbs.
Phosphoric Acid	1,818 lbs.	2,160 lbs.
Value of excess of Nitrogen @ 8 as. per lb.	Rs.18	—
Value of excess Phosphoric acid @ 8 p. per lb.	—	Rs.14-4-0
Gain in favour of Fish Guano	Rs.8-4-0	—

This gain is increased as the cost of transport increases and though it may seem a small amount, being in the neighbonrhood of 1%, it is worth saving.

Ground-nut Poonac is usually considered to be the cheapest form of organic nitrogen. An average sample of this poonac should contain 8% of nitrogen, but this year I have had a number of samples through my hands which contained only 5% of Nitrogen and in some cases even less. My friend and colleague Mr. Harrison suggested to me that this might be due to the presence in them of an undue amount of husk, due either to bad decortication, or to their preparation by an expeller method. I therefore determined the amount of crude fibre in a number of these samples with a low nitrogen content.

A sample of Ground-nuts purchased in the bazaar gave the following distribution of Husk and Kernels :—Husks 24·7%, Kernels 75·3%. The kernels are covered with a thin brown skin containing fibre but this amounts

to very little. Now the amount of fibre and nitrogen in the Husk and Kernels is very different and the following figures were obtained:—

	Husk.	Kernels.
Crude Fibre	56·88	2·31
Nitrogen	1·68	5·32

Moreover the kernels contain some 50% of oil while the Husks contain none. It is obvious therefore that after the oil has been extracted from the nuts the amount of Husk left in the residual Poonac must have a large controlling influence on the nitrogen content of the residual Poonac.

That this is so is shown by the following series of analyses. The first two show the relation of Crude Fibre to Nitrogen in samples of the best decorticated Ground nut Poonac, kindly supplied me by Messrs. Parry & Co.: the others show the relation in Poonacs less carefully prepared. I have not yet been able to obtain any genuine samples of Poonac prepared by expeller methods to act as comparisons, but these first two samples will serve for the present as standards of what a good ground-nut poonac should be. I hope to do some more work on this subject when more samples can be obtained and the results will be published in due course.

No.		Crude Fibre.	Nitrogen.
133	Crushed Decorticated Poonac ...	2·07	2·98
	Uncrushed Decorticated Cake ...	2·93	8·26
125	Chuck made Poonac	2·41	8·12
125	Machine made Poonac	16·46	6·86
138	Poonac	14·06	6·30
137	Poonac	16·70	6·30
135	Poonac	36·60	5·46

It will be seen that these Poonacs with low Nitrogen content all contain a high percentage of Fibre while those with a normal nitrogen content in the neighbourhood of 8% contain only about 2% of Fibre.

The fact that a number of low grade samples are on the market points to careless decortication methods and I would ask Firms to pay more attention to this point.

The practical moral for the planter is to always buy his Ground nut Poonac on a guarantee and to have this guarantee checked, and arrange the price paid on the result of this checking analysis. It will be obvious that the difference in price between a Poonac containing 8% of nitrogen and one containing 5·46% should be considerable.

The War has reduced our plantations to the verge of Potash starvation. Germany have almost a monopoly of the supply of Potash fertilisers which are obtained from the huge deposits at Stassfurt. The Board of Trade state that the sales of the German Potash Syndicate in 1914

amounted to 74 million pounds sterling and in 1913 to 96 millions. Few other deposits of Potash exist, though America has hopes in the Searles Lake deposits in California while recently deposits of Potassium carbonate have been discovered in Spain near Coldona. Whether when the War is over we shall be in a position of independence of Germany for our Potash remains to be seen, but it is to be hoped that the Stassfurt mines will be seized as part of the indemnity she will have to pay, so that there can be no question again of a German monopoly.

In the meanwhile it behoves us to consider what we can do to tide over the present period of shortage and I have a few suggestions to make which I hope will lead to a discussion on this important subject.

In the first place it must be remembered that in India we have a fairly large supply of Saltpetre and under some circumstances this is suitable as a fertiliser. But when this salt is used it must not be forgotton that the Nitrate portion of it is a quick acting stimulating fertiliser and it must not be applied before seasons of heavy rain or there is a danger of the Nitrate being washed out of the soil and lost in the drainage water. For these reasons Saltpetre is not always a suitable fertiliser on the estates and it must always be used with caution.

It is possible, however, to use Saltpetre as a base of a low grade Potash fertiliser, by removing the Nitrate with Sulphuric Acid and making Nitric Acid. The residue after this treatment consists of an acid Sulphate of Potash and if Lime is mixed with this to neutralise it we get a double sulphate of Calcium and Potassium which can be used as a fertiliser while the Nitric acid has a considerable commercial value.

On my return from England last October I had the pleasure of discussing this process with Mr. Bernard, Messrs. Parry & Co's. Chemist, with the result that it has been carried out on a small scale at their works at Ranipet and a Potassic fertiliser was obtained which contained 11·76% Calcium oxide and 22% Potash. The cost of this is about Rs.100 per ton, making Potash cost 3 annas 3 pies per lb. as compared with 2 annas 2 pies a lb. in Sulphate of Potash before the war. I have, however, little doubt that if this salt were manufactured on a larger scale and there be a demand for it, its price could be reduced.

Planters who have in the past manured their estates highly and used Potash consistently can no doubt do without this element for a year or so, by bringing into availability the unused residues in the soil by means of frequent cultivation. This especially applies to Tea estates. Again some of our soils have fairly large reserves of Potash in them in an insoluble or slowly soluble form and these reserves can be made available to the plant by cultivation and the application of Lime and I am of the opinion that one of the best and most practical things we can do is to spend the money which would normally have been spent on Potash on giving our soils heavy dressings of Slaked Lime. For Coffee, applications should be made at the rate of one to two tons per acre of slaked Lime, while on Tea estates five and six hundredweights up to a ton per acre may be applied with advantage, depending on the type of soil. Rubber soils too would undoubtedly benefit by applications of a ton an acre. I am quite aware that there are difficulties in the way of this procedure, shortage of Lime supplies for one thing, of transport for another, and labour and prices are also factors, but where it can be done I feel assured that it will be a good plan. When the Potash supplies again become available the reserves which have thus been drawn upon must be replaced by increased application of Potash fertilisers.

In Mundakayam recently a trial has been made of burning shell on the estate instead of buying burnt Lime and this will undoubtedly pay, but it must be remembered that good and thorough burning is essential. In one trial for instance the lime after burning and slacking contained 29% of Calcium carbonate—unburned material. This point needs watching and the final product should not contain more than one or two per cent. of carbonate. I think it must pay in cases where the raw material can be obtained cheaply and easily to build a proper kiln of stone and go in for lime burning on a somewhat large scale. Once more I would whisper co-operation knowing, however, it is one of the things *tabu* among South Indian Planters.

Another method of getting over the difficulty is to grow green manures, Many green manuring plants are deep rooted and draw Potash from the lower levels of the soil, and when subsequently cut and dug in, supply it in an available form where the roots of the crop can reach it. On Tea and Rubber estates and in young clearings in Coffee this is to be strongly recommended.

That Green dressings do supply valuable quantities of Potash is well known. To mention only a few—

Indigofera tinctoria contains		13·4%	Potash in its Ash.	
Tephrosia tinctoria	,,	16·4%	,,	,, ,,
Cassia hirsuta	,,	1 %	,,	in the sun dried Plant.
Sesbanias	,,	3 %	,,	in the dry state.
		25 %	,,	in the Ash.
Sophora glauca	,,	24 %	,,	,, ,,
Tephrosia purpurea	,,	24 %	,,	,, ,,
Crotalaria striata	,,	35·5%	,,	,, ,,

These are all well-known green dressings plants easily grown on our estates.

Finally use may be made of Wood Ashes. These are a valuable form of Potassic fertiliser and the amount of Potash they contain depends a great deal on the materials from which they are made. On large estates arrangements might be made to collect the ashes from the cooly lines which would yield a considerable supply of Potash annually. Care should be taken to collect them in a fairly pure state and to store them in a dry place; the Potash in Ashes consists chiefly of Carbonate and is very soluble, so that if rain falls on the ashes before they are applied to the soil a large portion of the Potash in them is lost.

Another source of ashes in some places might be Lantana and general scrub jungle on waste land. Lantana gives very little Ash, but that Ash contains a very high percentage of Potash, 12%. The ash from boiler flues and chimneys is said to contain 10% of Potash, while ash prepared from saw-dust and waste wood also contains a considerable amount of Potash.

How far such sources of supply of Ashes from waste land, waste wood products in forest areas, saw-dust from the West Coast saw pits and mills, boiler and furnace ash from factories, ashes from villages, and lines, coconut waste, &c., may be available in a pratical way, I am unable to say definitely, but at the present time all such sources are worth looking after and wherever individual planters find them easily available it will undoubtedly prove profitable to make use of them.

A sample of Wood ashes submitted to me from an estate in Coorg last March proved to contain 42% of Lime, 1·6% of Phosphoric Acid and 3·9%

Potash and I valued it at Rs. 16 per ton. Ashes prepared from Bamboo, Lantana, &c., will contain more Potash than this. The following figures which have been collected from various sources show the percentages of Potash in the Ash of some common waste products.

	% age of Ash.	% age of Potash in the Ash.
Albizzia prunings	4·4	22·8
Coconut husk	5·3	47·0
„ shell	1·3	26·5
„ leaves	10·9	1·1
Fern	...	29·0
Erythrina lithosperma	7·3	35·1
Hevea leaves	4·4	25·8
„ wood	6·0	13·5
Leucaena glauca	6·5	25·1
Sophora glauca	5·4	24·1
Soft coal	...	0·2
Casurina	...	4·9
Sisal	...	8·0
Mixed Wood Ashes	...	2·0

Progress of the Metric System.

According to the latest report of the Decimal Association, the war has made it more clearly evident than ever before that if we are to increase our foreign trade we must adopt rational weights and measures, at any rate in our dealings with foreign countries. Our Consuls and representatives continue to point out the futility of British manufacturers continuing to issue catalogues in terms of antiquated weights and measures. Thus our Ambassador at Rome states that such a wave of antipathy to Germany and enthusiasm for England has swept over Italy that there is a desire to boycott German goods and deal with British firms. If travellers understand Italian and can quote in the metric system they will capture trade.

The year 1914 will be for ever memorable as the year of great changes, the year in which the whole of men's preconceived notions went by the board, and the year in which events occurred which entirely altered the view-point of the British people. Never in the history of the Decimal Association has there been so much public interest displayed in the metric system as there has been since the outbreak of the war, mainly arising from the conviction of merchants and manufacturers that we are on the threshold of a still greater era for British trade and that we should be prepared to enter upon it with up-to-date methods. Even China, so long regarded as the least progressive country in the world, has in the matter of weights and measures reform set an example that might well be followed by nations who consider themselves much more advanced. By the new Weights and Measures Act they have instituted a system of weights and measures that is based entirely on the metric system

The Secretary of the Society (Mr. G. E. M. Johnson) is now serving his country with A Battery H. A. C. During his absence his duties have been undertaken by Mr. Marshall J. Pike.—*The Export World and Commercial Intelligence.*

LABOUR DEPARTMENT

OF THE

U. P. A. S. I. (INCORPORATED.)

Report of the Director.

GENTLEMEN,

I submit my report for the first year's working of the Labour Department.

Income.—The subscribing area was	... 98,118⅛ acres.				
Subscriptions at Rs.2 per acre	...Rs.	1,96,236	4	0	
of this the amount collected was	... ,,	1,73,755	4	6	
leaving a balance due by subscribers of	... ,,	22,480	15	6	on 30/6/15
since which all but Rs.3,326 have been collected.					
Interest received from the Bank was	... ,,	502	7	6	
The Estimate—sanctioned for the year by the Control Committee was	... ,,	1,65,530	0	0	
Expenditure.—The sum actually spent including	... ,,	156	3	0	on depreciation amounted to
... ...	... ,,	1,22,957	7	11	
which is less than the Estimate by	... ,,	42,572	8	1	
This was due to savings in the Srivilliputtur Division of	... ,,	5,000	0	0	
and in the Nagercoil Division of	... ,,	800	0	0	

The balance was unspent because of the difficulty experienced in getting suitable full time European officers for S. Canara and the Telugu divisions until quite at the end of the year and in selecting Indian Agents for work in all the divisions except Srivilliputtur and Nagercoil, which were taken over fully organized.

Accounts.—The Audited Accounts in your hands show the position on 30th June, 1915.

Work done.—The number of instances in which the assistance of the Department was invoked by Subscribers was... 1,804.

The total number finally disposed of was ... 630.

The number of such cases which for various reasons, and after everything possible was tried, had to be dropped with the consent of the subscribers concerned was ... 24.

Pendency.—The balance of cases pending, that is, about which correspondence, enquiry and action is still in progress numbers 1,150.

Recoveries.—The amount of cash which the Department recovered from defaulters and remitted to subscribers was	...Rs.	15,488	6	6
The amount which was found to be irrecoverable by any known means was	...Rs.	6,199	5	4
and the amount still due by the same defaulters is	...Rs.	968	0	0
Total involved in these cases	...Rs.	22,655	11	10

The percentage of recovery to demand in these cases is therefore about 68⅓.

The balance of cases pending, as above, have still to be dealt with. This result was obtained simply by palaver in most instances. No Vakils fees were paid and the Courts of law were not resorted to except in very few cases.

I assert with confidence, that had it been the other way about, the result would not have been nearly so satisfactory, and the money recovered through the law courts would probably have been swallowed up in the way so well known to those who have experience of litigation. The skill which has to be exercised by our Staff, to get anyone of the class of people with whom we have to deal, to pay their debts or any part of them, can be imagined only by those who realize that most of them have no property, when the art is closely akin to that of coaxing the breeches off a Highlander, or if they own property it is mortgaged up to the hilt, which to me as an Irishman is a certain guarantee of indisputable good birth and gentility, and equally with the proud possession of an ancestral debt in this country, carries with it the inability to pay.

Defaulters.—412 defaulters were induced to return to the Estates of subscribers to work off their indebtedness amounting to Rs. 32,392-10-10. Of these 260 actually arrived on the Estates, and represented a sum of Rs.24,098-8-5. The percentage persuaded to keep their word was therefore about 63%. Of those that did not fulfil their promise, the great majority have not been lost sight of, only a few made themselves scarce, but watch is kept for them. It would be interesting to know the amount of money worked off by such as reached the Estates, but I have not the power nor the desire to add to the office work of subscribers by asking them to send in such returns. The amount per head comes to Rs.80 and it is unlikely that more than a tenth part of this was worked off. When they leave the Estates again with or without permission, subscribers again put the Department on to them, and they have to be dealt with *de novo.*

The Main object has been gained: we have shown to all the World that defaulters have no easy time, and never fail to contrast their state, with that of people, happily more numerous, who find that in spite of their inclination, comparative honesty is after all the best policy, and leads to a life of affluence which to the practical is at any rate free from the worry of the Labour Department, and to the imaginative, free from all care. I have mentioned this as the main object, for all else is subordinate to it, and it is not a true way of looking at things, to judge the work of the Labour Department by Statistics alone.

Internal Competition.—The number of cases which the Department assisted to regulate was 49

Unfair Competition.—was dealt with in ... 50 instances.

External Competition.—Neither the conditions in Malaya, nor the riots in Ceylon had any direct effect on the recruiting operations for S. Indian Estates, there may have been some indirect benefit, but it was not appreciable. Our advanced labour has not been enticed out of the country. Maistries and other defaulters owing money to our subscribers sometimes emigrate with a view to escaping and avoiding the trouble given to them by the Labour Department. The Ceylon Labour Commissioner has proved his willingness to help us, and we will abide by our promise to reciprocate. A similar amicable arrangement can no doubt be come to with the authorities in charge of recruiting operations for Malaya.

Information about Kanganies and Maistries was supplied to the number of 515.

Laggards.—1,241 were hurried up.

Assistance was applied for by 1,005 Maistries and Kanganies who were helped in all their difficulties.

Advice was given to those Estates which applied for it about where and when to get coolies.

Warrants.—30 Civil and 92 Criminal warrants were served through the Department.

One of the chief difficulties can be overcome by Subscribers themselves who must give the correct names and addresses of their defaulting Maistries, and see that Maistries do the same of their coolies. Otherwise no Department, and no Government can help them. The proper use of the Department by Subscribers will get over this difficulty. Subscribers should provide themselves with the Alphabetical list of villages in the Taluqs and Districts of the Madras Presidency, 1914 Edition, price 9 annas, obtainable by V. P. P. from the Superintendent, Government Press, Madras. Hamlets are not given, but when Maistries and coolies give any name not in this list, they should be asked the name of the Mother village or Gramam. The list of villages of the Mysore State price Rs.4 is published at the Government Press, Bangalore: it gives a lot of other information being Part V of the Mysore Census of 1911 and is a village population table.

New Connections.—1,043 villages were searched for new connections. The work was commenced late, when the weather was favourable for local cultivation, so no immediate result could be expected, but a foundation has been laid on which future operations will be built up.

Advertising.—Special and general was done in particular villages and over various tracts of country. One Cinema film to advertise Tea Estates was prepared, but it will not be used until the Rubber and Coffee Estate films are ready to show simultaneously. Embossed and coloured Tin plates have been ordered, and will be ready before next recruiting Season.

Estates.—47 were visited at the request of Proprietors and Managers with a view to helping on labour matters.

Professional Recruiters.—Measures were taken to discredit the operations of 12 Professional recruiters.

Restriction of Advances.—27 particular instances cropped up and were dealt with, but the general question which is a vital object of the Department, was only dealt with earnestly in the Kanan Devan District. Complete success could not be expected in one year but the amount of success attained is distinctly encouraging and impels me to impress on all employers of labour, whether they are subscribing to the Department, or not, the possibility and necessity for co-operation in this matter.

It is well known that the advance system is at the bottom of most if not all of our labour troubles. Most districts are now considering the adoption of certain rules and regulations to deal with local labour difficulties, and as a supplement to these, the amount of advance to be given per head for coolies should be fixed and agreed to by everybody in each district, whether they belong to Planters' Associations or not.

To all Proprietors of Estates, I say: You are risking money needlessly in advances, if you do not take the opportunity to combine in fixing a rate.

To the Directors and Shareholders in Britain and elsewhere of Companies owning Estates in S. India, I say : Your interests are not being properly looked after if advances are higher than they need be, and they need be no higher than the rate fixed and agreed upon by Planters in those districts where your Estates are situated.

To Superintendents and Managers in charge of Estates belonging to others, I say : You are not looking after the interests of your employers if you do not agree and do not abide by the limit for advances fixed in your particular District. The man who claims to "gang his ain gait" in this matter, proclaims his ignorance of present conditions, and his inability, or worse still his unwillingness, to look to the future.

To the Subscribers of the Labour Department particularly I say with all the emphasis at my command : You are not getting anything like full value for your money if you do not combine in this matter, and loyally keep to the limit of advances which may be agreed upon in your district.

Undoubtedly all sorts of anomalous positions will become apparent, all of us are aware of some of them now, but a beginning must be made sometime. The opportunity to begin presents itself, and advantage of it should be taken now. Although in the foregoing paragraphs I have insisted on the necessity for combination, I am at a loss to see how this unity can be made really effective unless it be done through some central organization. *Such an organization capable of dealing successfully with this important subject is ready to hand in the Labour Department of the U. P. A. S. I.*

Registration,—A list of questions was circulated last year, in which No. 14 was asked with a view to obtaining particulars for a Directory of Labour Suppliers, Maistries and Kanganies, so as to lessen the chance of 2 or more Estates advancing the same man, which is one of the difficulties with which we have to contend. Owing to the number of people with *aliases*, some means of identification is necessary, the impression of thumb marks seems to be the simplest for our purpose. A man to classify and read thumb marks has been trained at the Department's expense, and has now taken charge of his work. The Directory is consequently being taken in hand with a view to a future Registration Scheme, if found to be desirable.

Payments were made at the request of subscribers on their behalf to 49 Maistries, a practice which the Labour Department does not encourage on principle, as it is considered inadvisable in money matters to introduce a third party between Master and servant.

Warnings.—16 Circulars containing the names of 139 men who should not be advanced by subscribers have been issued, and it is known that owing to these warnings, money has been saved which otherwise would have been lost to a certainty. Although the lists are confidential, the information has of course leaked out, and the men knowing they are watched for, seek their prey elsewhere than on Subscribing Estates.

I remain, Gentlemen,

Yours most obedient servant,

AYLMER Ff. MARTIN,

Director of the Labour Department,
U. P. A. S. I. Uncorporated).

Bangalore, 13th August, 1915.

SOUTH INDIA PLANTERS' WAR FUND.

		Rs.	A.	P.
J. J. Murphy	(in five instalments)	1,500	0	0
J. A. Richardson	(in six quarterly instalments)	1,200	0	0
E. F. Barber	(do do do)	1,200	0	0
J. S. Nicolls	Till the end of the War (per mensem) ...	40	0	0
P. G. Tipping	do do ...	20	0	0
G. R. Pearse	do do ...	20	0	0
W. A. Lee	do do ...	20	0	0
H. Waddington	do do ...	30	0	0
A. C. Morrell	do do ...	25	0	0
B. Malcolm	do do ...	50	0	0
N. C. Whitton	do do ...	25	0	0
A. B. Boyd	do do ...	25	0	0
S. H. Dennis	do do ...	20	0	0
C. Danvers	do do ...	20	0	0
John Carless	do do ...	20	0	0
Albert Wright	do do ...	20	0	0
C. H. Browne	do do ...	40	0	0
C. J. Hayward	do do ...	25	0	0
E. W. Simcock	do do ...	40	0	0
Guy Turner	do do ...	20	0	0
E. H. F. Day	do do ...	25	0	0
Aylmer Ff. Martin	do do ...	25	0	0
F. Norton	do do ...	25	0	0
A. S. Dandison	do do ...	25	0	0
F. W. Winterbotham	do do ...	20	0	0
W. H. Lincoln	do do ...	10	0	0
Sir Hugh Daly, K. C. S. I.	(Donation)	150	0	0
Sir Leslie Miller	do	250	0	0

SUMMARY.

1. Five instalments	1,500	0	0
2. Six quarterly instalments	2,400	0	0
3. Till end of the War	6,980	0	0
4. Donation	400	0	0
Total Rs...	11,280	0	0

SCIENCE versus ROUTINE.

"The genius of scientific progress, after creating miracles in the industrial domain, has at last seriously undertaken to demolish agricultural routine, that fortress being which agriculturists have entrenched themselves, and where the deaf and blind will not hear nor see what is to their advantage, thus slowly, very slowly, has agriculture progressed in this age of gigantic strides and discoveries." So wrote Eugene Lange some years ago in the "Official Journal of the Central Board of Agriculture of Trinidad."

The last revelation will cause a revolution in agriculture. The worn-out of old Europe will become as productive, if not more so, than that of the Far West of America. The earth will lose its prestige—for there will be no difference between good and bad soil—since soil is not necessary to grow potatoes.

The eminent agronomist, Alfred Dudony, has succeeded in growing potatoes, most esculent, in wire baskets without a particle of earth. It is thus proved that eclosion life and prosperity of plants in general, and potatoes in particular, will not require them to bury their roots in the earth, since, with chemicals and scientific culture, they will be independent of soil.

Mr. George Ville having sown four grains of wheat on burnt sand, and watered them with some chemical solution, obtained, for every grain of seed, 20 grains of wheat with straw. The result of these experiments goes to show that the soil itself has no creative power or virtue. Its functions are to support vegetation, to store and distil, under the influence of light, heat, and electricity, the alimentary substances indispensable to the auto-creation, self-conservation, and automatic development of the organs and tissues of plants. The alimentary substances are known, have been counted and analysed. There are fourteen, not one more, not one less, asserts Mr. Emile Gautier. Organic substances: Carbon, hydrogen, oxygen, and azote. Mineral substances: Phosphorus, sulphur, chlorine, silicium, iron, manganese, calcium, magnesium, sodium, and potassium. These fourteen substances nourish all plants without distinction—the tiny grass as well as the giants of the forest—alimentary, venomous, tinctorial, gummy, oleaginous, resinous, textiles, flowers, fruits, &c. The difference are the result of variety of combinations of the primary substances that may be compared to the combination of the twenty-six letters of the alphabet forming a variety of words.

Of these fourteen substances essential to the life of plants, 93 per cent., are supplied by the atmosphere. In presence of such facts, evidently mere routine will not give an equal result conducive to increased crops from a given acreage.

It is absolutely necessary that the agriculturist should know what relation there is between the plant he cultivates and the soil on which it is cultivated. Advanced scientific agriculture is possible only with the aid of scientists. But it is quite easy for the intelligent agriculturist to step aside from routine and cultivate properly and judiciously. The following approximative analysis, which can be made without apparatus or more than one chemical, will answer in most cases, and ensure better results than are now obtained by many agriculturists.—*The Queensland Agricultural Journal.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 36.] SEPTEMBER 4, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

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The Director of the Labour Department writes us to the effect "That the Department is now in a position to deal with 100,000 finger prints. Thumb impressions are sufficient. It is hoped that subscribers will make full use of this Branch of the business. The first step is to send to the Director's Office the thumb impression of all people in the subscribers' employ. The second step will be to send the thumb impressions of those asking for advances, so that on reference to the finger print files, it may be ascertained whether the applicant is registered by any other estate or not. In this connection please study page 286 of the *Planters' Chronicle* Vol. X, No 22 for the month of May 1915."

It will be remembered that at the Annual General Meeting lately held it was stated that 26,000 acres belonged to non-subscribers. The information, we regret to say, was incorrect. Lists are being circulated to District Associations to find out the exact acreage of subscribing and non-subscribing members. A corrected figure will be published on return of the lists. At present it is found that about 7,000 acres represent the non-subscribing acreage.

From the Kanan Devan Planters' Association comes the following notification of names to be added to the list of planters who are serving with His Majesty's Forces:—

E. H. Elliott, (Travancore Government Service) I. A. R. O., 2nd Lieut., 3rd Sappers and Miners.

R. C. Vernede, Gunner, A H2, R. F. A.

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A. H. Sheldrick, 33rd Cavalry. Gone to the Persian Gulf.

C. A. Reid has gone to East Africa.

U. P. A. S. I. EXHIBITION, 1915.

In accordance with the usual custom, an Exhibition of Products was held at the offices of the U.P.A.S.I. during the Annual Meeting. The Exhibition was smaller this year than usual, no samples of Tea or Coffee being sent.

A number of samples of Rubber were sent down, and in accordance with a wish expressed by several Rubber growers, a small Committee was appointed, consisting of Messrs. H. Waddington, N. C. Whitton, and J. J. Murphy, to examine these samples and report on their merits. This is a new departure and one which it is to be hoped will be adopted at future Exhibitions, since it arouses interest in the samples and shows exhibitors that an interest is taken in their samples and that it is worth the trouble of sending them.

The Report of the Committee submitted to the Chairman of the U. P. A. S. I., and read during the Meeting, was as follows :—

"In accordance with your instructions, we have inspected the exhibits of rubber at the U. P. A. S. I. offices, sent in by different members of the District Associations.

"Samples of Rubber were received from :—The Central Travancore, Teekoy, Travancore, Cochin, and Kerala Rubber Cos., and the Eldorado and Boyce Estates.

"All are such excellent examples of our Rubber Industry, and care in curing, that we have found it difficult, if not invidious, to commend one above the others.

"There are two grades specially shown, Smoked Sheet and Pale Crepe. Of the former, we consider that sent by Teekoy is the best, the exhibit by South India Rubber Company being not quite so even. A very excellent sample from Kerala was only excluded from being bracketed in first place, owing to the edges having been trimmed.

"As regards the Pale Crepe, the first place rests between the examples sent from the Boyce Estate and that from the Travancore Rubber Company, the difference being so extremely slight that we are unable to differentiate between them."

An interesting sample of Rubber not mentioned by the Committee was on exhibit consisting of a smoked sheet prepared from Hevea Rubber planted in Mysore at an elevation of 3,000 feet. The trees have taken rather a long time to come into bearing, but they have grown a thick bark, easily tapped, and the quality of the Rubber produced is very high. In fact the sample shown fetched as high a price recently as any produced in what are usually looked upon as Districts more suited to the cultivation of Hevea in South India.

Messrs. Parry and Co., and Messrs. Peirce Leslie and Co. exhibited as usual samples of the fertilisers and estate tools and requisites they are able to supply. These exhibits are always of great interest but did not contain anything strikingly new this year.

The Madras Fisheries Department had a small exhibit of Fish Guano and Fish Oil Insecticides illustrating the paper on the subject presented to the Meeting by Mr. Menon, the Oil Chemist.

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A new feature of the Exhibition this year, and one to which we extend a hearty welcome in the future, was a collection of medicinal plant products and the extracts, &c., made from them shown by Mr. A. Pell, the Managing Director of the Mysore Pharmaceuticals, Ltd. This Company have recently put up a factory in Bangalore and many of the crude products used are grown in this country and others can be. In every District valuable plants are to be found which supply drugs, essential oils, &c., and in all of these Mr. Pell is interested. An Exhibit of this kind demonstrates the sort of things wanted and planters should be able to judge from it what they may be able to supply in the way of minor products of their Estates. As an example of this we noticed such commonly grown Indian products as Cardamoms, Cinnamon, Chilies, Cinchona succirubra, Citrus fruits, &c., to mention only a few.

We trust that in future years when his factory is completed, Mr. Pell will repeat this most interesting Exhibition on a larger scale, and give us an idea of the value of these products, so that planters may form an idea of how far it would pay them to collect or even cultivate on a small scale such minor products.

R. D. A.

OVERSEAS TRADE IN JUNE.

RUBBER BY QUANTITY.

Imports of Rubber*	1913.	1914.	1915.
From Dutch East Indies† (Centals of 100 lbs.)...	N. S.	N. S.	7,248
„ French West Africa ...	1,471	252	2,583
„ Gold Coast ...	1,265	680	393
„ Other Countries in Africa† ...	N. S.	N. S.	7,734
„ Peru ...	2,934	1,294	2,929
„ Brazil ...	18,198	19,290	21,410
„ British India ...	N. S.	N. S.	673
„ Straits Settlements and Dependencies including Labuan...	24,481	28,500	49,607
„ Federated Malay States ...	13,995	12,912	21,025
„ Ceylon and Dependencies ...	7,894	9,621	14,611
„ Other Countries† ...	36,521	26,944	7,133
Total Imports ...	106,759	99,493	135,346

Re-Exports of Rubber*	1913.	1914.	1915.
To Russia (Centals of 100 lbs.)...	11,594	6,335	37,338
„ Germany ...	21,083	24,602	—
„ Belgium ...	3,532	3,759	—
„ France ...	9,408	14,866	9,062
„ United States of America ...	30,329	43,528	68,720
„ Other Countries ...	7,617	8,033	16,505
Total Re-exports ...	83,563	101,123	131,625

*Prior to 1915 these figures include waste and reclaimed rubber as well as raw rubber.

†Prior to 1915 imports from Dutch East Indies, British India, and "Other Countries in Africa" were included opposite the rubric "Other Countries."—*The India-Rubber Journal.*

AGRICULTURAL STATISTICS OF INDIA.

In our issue of 19 June 1915 the Agricultural Statistics of British India were dealt with. The Second volume has just come to hand containing statistics for Native States for the year 1912-13 compiled from annual returns furnished by the State Durbars through the Political Officers.

The total area of Native States in India is some 498 million acres with a population of 72 millions. The Madras States under the control of Local Governments and Administrations consist of 6,791,000 acres with a population of 4,812,000.

Mysore State.

Mysore, a State having direct political relations with the Government of India has an area of 18,859,200 acres and a population of 5,806,000. Of this area 7,591,600 acres are under cultivation, 2,260,500 acres are in forest, and 6,656,600 acres are not available for cultivation. 962,500 acres are under irrigation. The following are the areas under the main crops in the State :—

Food Grains and pulses	5,396,000	acres.
Oil Seeds	330,700	,,
Sugarcane	41,600	,,
Cotton	151,900	,,
Coffee	105,900	,,

The area of Coffee in each District in Mysore State is as follows :—

Bangalore	2	acres.
Tumkur	4	,,
Mysore	624	,,
Hassan	26,046	,,
Shimoga	332	,,
Kadur	78,867	,,

Travancore State.

The total area of Travancore State is 4,868,032 acres divided up as follows :—

Forests	544,264	acres.
Not available for cultivation	363,763	..
Culturable waste	625,396	,,
Current fallows	118,117	,,
Area cropped	1,881,793	..
Irrigated land	825,805	,,

The following are the areas under the chief crops :—

Food grains and pulses	1,209,508
Oil seeds	140,636
Sugarcane	9,162
Coffee	10,393
Tea	38,634

Cochin State.

The total area of Cochin State is 904,514 acres divided up as follows :—

Forests	68,213
Not available for cultivation	65,335
Culturable waste	10,126
Current fallows	24,365
Area cropped	476,147
Irrigated area	158,721

The following are the areas under the chief crops :—

Food grains and pulses	296,989
Oil seeds	21,220
Sugarcane	56
Coffee	8,218

Total Areas of Crops in S. India.

Taken in conjunction with the figures published in our issue of 19th June, we thus arrive at the following totals for Southern India. Rubber does not appear as a separate section in the official statistics and the acreage under this crop has been arrived at from other sources and it is probably inaccurate :—

	Coffee.	Tea.	Rubber.
Madras Pesidency ...	49,287	23,880	17,278
Coorg ...	42,510	—	1,362
Mysore State ...	105,900	—	—
Travancore State ...	10,393	38,634	19,568
Cochin State ...	8,218	—	5,917
Totals ...	216,308	62,514	44,125

The Detailed Report of the General Committee of the Indian Tea Association for 1914 contains a report on the Production of Tea in India during the year 1913, from which the following facts and figures have been extracted.

In this Report the area of Tea in Southern India is given as 63,700 acres which agrees fairly well with the result arrived at above. The total area of Tea in India is put at 609,700 so that South India contains about 10·4% of the total area.

The total number of Tea plantations in India during 1913 was 4,386. These plantations vary greatly in size in the different provinces. In Assam the average size of a plantation is 489 acres, in Bengal 547 acres, and in Travancore 390 acres. In Madras the average is much smaller, being about 161 acres.

The total production of Tea in India during 1913 is put at 307,097,000 lbs. of which South India is credited with 22,245,000 lbs. or 7·2% of the whole. The average production of tea per acre varies very greatly in the

different districts as is shown in the table below—the general average for all India being 554 lbs. per acre.

	lbs. per acre.		lbs. per acre.
Jalpaiguri ...	691	Nilgiris ...	393
Sylhet ...	570	Chittagong ...	373
Cachar ...	561	Darjeeling ...	344
Travancore ...	514	Kangra ...	229
Malabar ...	483	Ranchi ...	154
Coimbatore ...	452	Hazaribagh ...	43

The total quantity of Green Tea produced in India during 1913 was 3,272,000 lbs. as compared with 4,825,000 lbs. in 1912 and 5,210,000 lbs. in 1911. Of this South India is credited with 521,399 lbs as compared with 1,822,743 lbs. in 1912, or 15·9 % of the total production. Bounties were paid on green tea from the Tea Cess Fund up to March 1909, but since that date no bounties have been paid and with the present high prices for black tea the inducement to manufacture green tea appears to be getting weak.

The total figures of exports of Tea by sea and by land during 1913-14 were 289,519,000 lbs. and 2,196,000 lbs. respectively. The total exports by sea increased by 11 millions lbs. or 4 % as compared with 1912-13. Seventy-two per cent of the exports of Indian tea is directed to the United Kingdom. The total quantity imported into the United Kingdom from India, however, is not consumed there, a considerable portion is re-exported to foreign countries. During 1913 the total of such re-exports was 21,830,000 lbs. the largest quantity going to Russia. Of the total export of Tea from India 21,474,000 lbs. were shipped from South Indian ports or 7·4% of the total. The following table shows the comparison between the exports of Tea from India, Ceylon, and China, the three rival tea-supplying countries in the world's market.

	1912-13.		1913-14.	
India	281,815,000	lbs.	291,715,000	lbs.
Ceylon	186,632,000	,,	197,419,000	,,
China—				
Black and Green ...	127,827,000	,,	103,038,000	,,
Brick, tablet and dust ...	69,733,000	,,	70,062,000	,,

The quantites of each kind of tea entered for home consumption in the United Kingdom are shown below, (in thousands of lbs.)

Total quantity entered.	1911.	1912.	1913.
Indian tea	168,745	165,298	172,844
Ceylon tea	89,120	93,529	91,518
China tea	14,495	10,576	9,683
Tea of other countries ...	21,143	26,006	31,646
Total ...	293,503	295,409	305,691
Consumption per head (in lbs.)			
All tea	6·48	6·47	6·64
Indian tea	3·72	3·62	3·75

Quantity in bonded warehouses.

	1911.	1912.	1913.
Indian tea ...	87,099	93,648	101,410
Ceylon tea ...	19,388	17,476	15,011
China tea ...	16,752	17,529	13,510
Tea of other countries ...	4,999	9,839	8,477
Total...	128,229	138,492	138,408

The reported figures of production are not strictly accurate and consequently any estimate of the consumption of tea *per capita* in India is vitiated at the outset, but in 1913 the total production was 307,250,000 lbs., the exports 284,453,000 lbs., leaving a balance of 22,797,000 lbs. The average balance for the last 5 years is only 17 million lbs.

The prices in 1913 show a general increase against the preceding year. The following are Calcutta prices :—

	1912,		1913.	
	As.	p.	As,	p,
Broken Pekoe	7	5	8	1
Pekoe	6	11	7	5
Pekoe Souchong	5	9	6	10
Declared value	7	8	8	4

The sales of Indian tea in London on garden account from 1st July, 1913 to 26 June, 1914 amounted to 1,791,451, packages, as compared with 1,754,148 packages sold during the same period in the preceding year. The average price realised in 1913-14 was 9·25*d.* per lb., as compared with with 8·65*d.* per lb., in 1912-13.

The number of persons employed in the tea industry is considerable as will be seen from the following figures :—

	Permanent.	Temporary.
Total number of persons employed in India ..	572,533	94,379
In Assam ...	413,897	43,130
In Madras ...	15,995	3,988
In Travancore ...	28,565	6,175

According to the returns of the Registrars of Indian Joint Stock Companies and the accounts of the companies registered in the United Kingdom, the capital of Joint Stock Companies engaged in the production of tea during 1915 amounted to about Rs. 26·9 crores, or over 17·9 millions :—

Companies registered in India ...	...Rs. 4,07,73,708
,, ,, United Kingdom ...	,, 22,78,19,445
Total	...Rs. 26,85,93,153

R. D. A.

Noél (P.). *Ce que les Plantes cultivées rapportent en France; ce que les Parasites nous coûtent.* (What cultivated plants yield in France, and what parasites cost us)—*Bull. Trim. Lab. Entom. Agric. Seine-Infér., Rouen*, No. 3, July-August-September 1914, pp. 3-13.

It is stated that 350 varieties of plants cultivated in France produce £360,000,000 sterling annually. They are attacked by about 6,000 species of insects and 2,000 cryptogamic diseases, which cause a loss of £120,000,000. —*The Review of Applied Entomology.*

RUBBER.

An Interesting Lecture.

Variability in Rubber—Cause and Effects.

Mr. J. B. Eaton, Agricultural Chemist to the Department of Agriculture, lectured recently to a gathering of planters and others at the Klang Club, Klang, F.M.S., on "Variability of Plantation Rubber, its Cause and some Contributory Factors."

At the outset Mr. Eaton explained that the experiments on this question, which had been in progress for some six months, had resulted in a large amount of evidence being obtained, but was, of course, very difficult at present even to suggest what would be the natural remedy for variability in plantation rubber.

Proceeding, he dealt with two terms of which he said they had heard much of late—standardisation and uniformity. The former was a rather hazy idea in connection with plantation rubber, for they had no standard and it would be difficult to set up one. There was a tendency to look fine hard Pará as the standard, the manufacturer having had considerable experience with it, extending over some years. That, however, was the only argument in its favour: he thought he could convince them there was no other reason why they should adopt it as the standard. Standardisation was, in fact, a very nice word to juggle with, but it was a very hazy idea. Uniformity meant rubber of the same type, but there again they had to contend against difference of ideas on the subject. Some said smoked sheet, others pale crepe, and so on, referring to types of raw rubber. But he wanted to show them that the form in which the rubber was put up before vulcanisation was immaterial from the manufacturer's point of view.

The Broker System.

In speaking of variability he was not referring to variability in mechanical strength, although it might appear as such, but to something much more vital so far as the manufacturer was concerned. He was not going to talk about pretty smoked sheet, or pretty pale crepe, or any other grade. They had to make those pretty things now, because they had to depend on the broker, who only paid for pretty-looking grades.

The lecturer then went on to explain that all rubber, no matter in what form it reached the manufacturer, was by him creped, though the creping he gave it had little or no effect on it. Mr. Eaton then detailed the processes by which at the experimental station they vulcanized the rubber—the chemical combination of the rubber and sulphur, the calendering to remove air bubbles, and the vulcanisation. The manufacturer, he explained, had the choice of three different ways of getting any particular result in vulcanisation. He could increase the sulphur, so within certain limits, increasing the amount combining chemically with the rubber, or he could increase either the temperature at which the vulcanising was done, or increase the time, the effect of either of which was to increase the amount of sulphur combining and so alter the physical properties of the vulcanised rubber. At the experimental station they had decided to fix the amount of sulphur, to fix the temperature, and to vary the time.

First Experiments.

In their first experiments they found that all the rubbers tested gave their best results at a particular time, *viz.*, about $2\frac{1}{2}$ to $2\frac{3}{4}$ hours. They

got absolutely different mechanical properties if they altered the time. These rubbers, being very similar, gave no clue to any variability. Subsequently they got a rubber which vulcanised more rapidly, giving optimum mechanical properties at 1½ hour. That was a piece of Byrne cured slab. Was that due to some particular property of the Byrne cure, some wonderful discovery in connection with the process, or to the form in which the rubber was prepared? The next piece taken was an ordinary Byrne leaf, which gave a more normal time of 2½ to 2¾ hours. That told them that the rapidity of vulcanisation had nothing to do with the Byrne method of curing. Following this clue, they made similar slabs smoked in an ordinary smoke house which vulcanised in 1¼ to 1½ hour. Then they made slabs which had not been smoked at all, just pan coagulum. Given the same thickness, these vulcanised much more quickly than the Byrne-cured slab or the ordinary smoked slab. So evidently it had something to do with the form in which the rubber was prepared, and nothing to do with any smoking, which actually retarded vulcanisation.

From further experiments as to the time which elapsed before creping they came to the conclusion that the rate of vulcanisation had something to do with an alteration of something present in the latex and in the coagulum obtained from it. Rubber consisted roughly, of 94 per cent. of caoutchouc, one per cent. of mineral salts, 2 to 3 per cent. of resins. Neither the mineral salts nor the resins were likely to alter. The most probable substance to change was the protein matter; it was probably not the proteins existing in the latex, but some substance derived from it by some subsequent change which acted as the accelerator.

In subsequent experiments it was found that there coagulum need be left for maximum of about six days before being creped, as the change occurred during this period.

The Manufacturer.

Mr. Eaton then pointed out how the change, of which it was impossible to have any idea from the appearance of the rubber, affected the manufacturer, particularly the small manufacturer. The latter gave certain rubber a certain treatment, obtaining an excellent result. Another lot of rubber, apparently exactly similar, was given the same treatment with a bad result, which the manufacturer immediately concluded was due to a weak rubber, whereas the only trouble was he had not given the proper time of temperature in vulcanising, and the apparent weakness was due to under or over vulcanising.

The big manufacturer, with his testing laboratories had realised this some time ago, but he did not, of course, give it away. He naturally left the smaller manufacturer to find out things for himself.

Factors affecting vulcanisation then, as far as estate practice was concerned, were thickness, *i.e.*, amount of serum removed; smoking (which retarded vulcanisation): use of formalin or other antiseptics; amount of acetic acid and dilution of latex. There were probably natural factors such as the age of the tree, rubber from an old tree probably vulcanising more rapidly as it contained more caoutchouc and probably a larger proportion of protein and other constituents, though this was complicated by estate practice.

As to a remedy, it was at present very difficult to suggest one. Naturally, the more uniform methods now adopted on many estates tended to

greater uniformity, but the variability was chiefly in respect to rubber from different estates.

Selling by Test.

Rubber was now sold by brokers, who went entirely by appearance, which, as they had seen in the samples exhibited, had actually nothing at all to do with it. The only way was to eliminate the broker and sell by test direct to the manufacturer. In these experiments, in preparing the block of pan coagulum, which was left in this form for some days, they had really discovered a new type of rubber, which vulcanised more rapidly than fine hard Pará and ordinary plantation grades, which took a medium time. They had only tested eight or nine samples of fine hard Pará so far, but it was a remarkable fact that all vulcanised in about the same time. So it was not unnatural, having in view the variations of plantation rubber, that the smaller manufacturer had to rely on fine hard Pará. The reason for the lack of variation in fine hard Pará was the uniform method of preparation, and that not because of any intrinsic value of the method (smoking retarding the rate of vulcanisation) but because the preparation of a block or ball took two or three months; so many variations were averaged up.

A Bacteriological Problem.

The lecturer remarked that so far it looked as if the whole problem were not chemical at all, but bacteriological, *i.e.*, the accelerating substance was formed by bacterial action. If they could find out exactly what this accelerating substance was, then they could get rid of almost all of it by making thin crepe and letting the manufacturer add the accelerator as suited him best. Really, however, he doubted the advisability of that, because the rapid curing samples gave better mechanical strength than the slow ones. Rapid vulcanisation eliminated the danger of overheating, and that was probably the reason for this.

The lecturer remarked that Dr. Schidrowitz first pointed our this variability in rate of cure in plantation rubber of which their experiments at the Agricultural Department first showed the cause, and they were now able to prepare a rubber which would vulcanise correctly at any particular time, within certain limits.

His hearers might be interested to know, concluded Mr. Eaton that a big American company in Sumatra were sending all their rubber home in coagulated slabs three-quarters of an inch thick. They, of course, had a free hand, not having to sell through a broker.

Mr. E. B. Prior proposed a vote of thanks to the lecturer, coupling with it the name of Mr. Grantham, who had collaborated with Mr. Eaton, the vote being carried with applause.—*The Indian Planters' Gazette.*

Nitrate of Soda.—According to the *Home and Colonial Mail*, the total production of nitrate of soda for the past twelve months has been about 53,400,000 quintals, against 60,300,000 quintals last year. Since the war started wages have gone down considerably on the West coast, and this, coupled with the low exchange, has cheapened the cost of production to most producers by about 9d. to 1s. per quintal. The floating quantity for Europe and Egypt on December 31 was estimated at about 312,000 tons, of which about 102,000 tons are in German vessels held up in neutral ports. The port of Hamburg alone accounts for nearly one-third of the total world's deliveries of this article.—*The Gardeners' Chronicle.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 37.] SEPTEMBER 11, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert publishes an article on Insecticides.

Under the heading of Agricultural Statistics we also publish a further article on Tea Statistics.

The Manager of the Mercantile Bank of India, Ltd., writes to inform us that the Directors have declared an interim dividend on the A & B shares for the half year ending June 30th last at the rate of 8% per annum free of Income Tax and the Manager of the National Bank of India, Ltd., also writes that the Directors have declared an interim dividend at the rate of 16% (equal to £1 per share) carrying forward £147,492.

The following additions have been made of planters who have joined His Majesty's Forces.

COORG P. A.—W. A. J. Sheldrick, 33rd Cavalry, Persia, Mesopotamia.

SHEVAROY P. A.—Paul Goubert, Manager, Honey Rock Estate, Yercaud, has joined the French Army as a Trooper.

SOUTH TRAVANCORE P. A.—E. C. Sherman, Merchiston Estate, South Travancore, Captain, A. S. C.

ALTERATIONS.

COORG P. A.—C. E. M. Browne, I. A. R. O., 2nd Lieut. attached 40th Pathans, France.

MUNDAKAYAM P. A.—R. Lester now with A. S. C., Meerut.

WEST COAST P. A.—2nd Lieut. H. Browne, I. A. R. O. attached 24th Punjabis, Mesopotamia.

OVERSEAS CRAFT FUND.

Received	Rs.	1,072	8 0

SOUTH INDIA PLANTERS' WAR FUND.

Previously received	Rs.	11,280	0 0
Mrs. J. G. Hamilton (Donation)	,,	60	0 0
Mr. James Hume ,, ...	,,	150	0 0
Mr. C. E. Martyn ,, ...	,,	100	0 0
Mr, Stephen Bayley (Monthly)	,,	10	0 0
Total...	Rs.	11,600	0 0

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Insecticides.

It frequently happens that samples of Insecticides, &c., are sent us from England and the Continent with a request that they may be tried on our local pests, and stating that they are most efficient. There is sometimes no doubt about their efficiency but their price when compared with locally made insecticides of equal merit is prohibitive and consequently it is impossible to recommend their use to planters.

Mr. P. B. Richards, the 2nd Assistant Entomologist, of the F. M. S. Department of Agriculture, who is contributing a most valuable and instructive series of articles on the subject of the Control of Insect Pests to *the Agricultural Bulletin of the F. M. S.*, has some pertinent remarks to make on this very subject in the last number of the Bulletin to hand (III. 9) which I take the liberty of quoting as they exactly sum up the situation as I find it.

Mr. Richard says,—"The field of commercial enterprise offered by contact poisons has been exploited more than any other form of insecticides, with the result that there are now on the markets of the world large numbers of patent preparations, widely advertised but in the main calculated rather to bring profit to the pockets of the vendors than advantage to the users. Some proprietary spray-fluids are of considerable insecticidal value, while others are worse than useless. Those which are good are usually expensive, while the bad ones are dear at any price. None will bear comparison, as to efficiency and cheapness combined, with the standard non-proprietary washes or emulsions.

"The only point upon which the patent insecticides can fairly claim advantage is that of convenience. Making spray-fluids for oneself is certainly more laborious than purchasing them ready for use. There is often, too, some doubt as to one's ability to prepare the material properly, which may be the deciding factor in purchasing an inferior spray-fluid at a high price. Given a little care and attention, there is no reason whatever why almost all that is necessary in the way of contact sprays should not be made by the user. If, however, it is decided to purchase a patent preparation, the immediate purpose for which it is required should be carefully considered and an insecticide obtained which is prepared for that purpose. The use of extensively advertised cure-alls should be rigidly avoided.

"Whereas the use of home-made standard insecticides is recommended against the purchase of expensive proprietary spray-fluids, there is yet a perfectly legitimate field for enterprise in the preparation and marketing of standard washes and emulsions. If prepared in quantity by local firms, standard insecticides could be retailed at a profit at such prices as would render it not worth while for the planter to go to the trouble of making them for himself. To mention a few, there should be a market for naphthaline emulsion and tobacco extract, for lime sulphur concentrate, rosin wash and kerosene emulsion; and for crude oil emulsion, the preparation of which requires apparatus which would not be available on many estates."

In the case of Bordeaux Mixture which is being more and more extensively used in South India it is much the best plan to make it on the estate. In some cases, however, it is impossible to give it the careful supervision necessary for its successful preparation. In such cases a similar product which may be stored in a condensed form is Woburn Bordeaux Paste. The

Agents in India for this preparation are Messrs. Shaw Wallace & Co., Calcutta. The paste does not resist the Indian climate very well and is apt to decompose on keeping. Intending purchasers should therefore ascertain from the sellers whether fresh stock is available before ordering their supplies and should only obtain such quantities as they can use quickly at any one time.

Crude Oil Emulsion again is an insecticide difficult to prepare on the estate. It is obtainable from Messrs. Bathgate & Co., Calcutta.

To sum up, it is as a general rule the best plan to make up insecticides and fungicides on the estate and to use cheap materials easily obtained locally such as Fish Oil Resin Soap, &c., than to buy proprietary spray fluids from abroad.

RUDOLPH D. ANSTEAD,
Planting Expert.

Coffee.

The end of the Brazilian crop year, which runs from July to June, is generally a time for reviewing the statistical position. This year the world's visible supply is the smallest on record since 1901, and then the consumption, which is now practically 20 million bags in the twelve months, was much smaller. During June the stock decreased 719,000 bags against a reduction of only 327,000 bags last year, leaving the total only 7,538.000 bags, which is hardly five months' supply. The different markets of the world are, however, in such an unsettled state that it is most difficult to forecast the future. Owing to recent legislation and the practical prohibition of exports to many European countries, this market is temporarily at a standstill. If the London stock is to be left solely to the home trade there is far more than they ordinarily require, but if exporting is to be allowed again, the stock is much too small for the demand that may be expected. Some of that usually taken by the Continent could be used by the home trade, and would make up for the deficiency in Costa Rica, but other choice qualities such as Mysore and Vera Paz, for which nothing can be substituted, will doubtless remain dear throughout the season. If the export trade is likely to be stopped for any length of time shippers will discontinue to send supplies here, and so our stock will soon be depleted, at all events of all those parcels that can be used. Quotations throughout the week have been very irregular; some merchants have been willing sellers, and prices are accordingly lower, but the bulk has been withdrawn until matters have settled down. A Committee of the trade has been formed, to communicate with the Government, in the hope of making exporting easier, but still under supervision.

London Coffee Returns.

	Home* Consumption.		Export.		Stock.	
	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.
For week ended July 3 ...	358	268	1,007	860	24,072	22,772
For 27 weeks ended July 3 ...	11.690	8,400	16,906	15,690	—	—

*The Home amount contains a proportion for Export delivery by cart.

—*The Produce Markets' Review.*

AGRICULTURAL STATISTICS.

In our last issue we published a number of statistics relating to Tea, and to complete this, with the object of making our pages a source of reference on the subject, we now publish some further statistics relating to Tea compiled from the *Report of the General Committee of the Indian Tea Association (London)* for 1914-15 which comes to hand by the mail.

The Report gives the following figures of area and production for the year 1913.

	Area,		Production.	
Assam	367,549	acres	199,721,950	lbs.
Bengal	158,162	,,	80,420,336	,,
N. W. Provinces & Bengal ...	17,300	,,	4,708,907	,,
S. India	66,708	,,	22,398,477	,,
Ceylon	399,000	,,	192,176,160	,,

EXPORTS OF TEA IN INDIA.

From Northern India—			
Outside United Kingdom	...	52,974,040	lbs.
To United Kingdom	...	220,669,383	,,
From Southern India	...	20,973,120	,,
Total	...	294,616,543	lbs.
From Ceylon—			
Outside United Kingdom	Black...	74,115,580	lbs.
	Green...	3,937,663	,,
To United Kingdom	Black...	116,619,404	,,
	Green...	543,772	,,
Total	...	195,216,419	lbs.

The following is the analysis of Southern India tea shipped from Cochin, Tuticorin, Quilon, Alleppey and Calicut and transhipped at Colombo during 1914 :—

Destination.	Shipped from South Indian Ports. lbs.	Transhipped at Colombo. lbs.
London	11,990,042	491,424
America	5,540,641	682,299
Colombo	2,916,735	—
Indian ports	363,478	1,394
Asiatic ports	148,429	—
Germany	2,515	31,059
Russia	7,360	556,653
Other places	3,920	—
China	—	554,307
Australia	—	795,977
Austria	—	8,136
Holland	—	760
Africa	—	12,579
Asia Minor	—	2,500
Malta	—	2,185
Total ...	20,973,120	3,139,273

The total quantities of tea shipped from the Tea producing countries during 1914 were :—

From India	...	...	306,677,100 lbs.
Ceylon	...	...	195,216,400 „
Java	...	...	71,297,700 „
China	...	...	189,250,000 „
Japan	...	...	39,475,400 „

R. D. A.

DISTRICT PLANTERS' ASSOCIATIONS.

South Travancore Planters' Association.

Proceedings of the General Meeting held at the Quilon Club, on Saturday, 28th August, 1915, at 10-30 a.m.

PRESENT,—Mr. L. G. Knight (Chairman), Messrs. C. Hall, A. W. Upcher, A. W. Leslie, and T. P. M. Alexander, (Honorary Secretary). Visitors: Messrs. J. L. Henderson, E. Lord. W. G. Thom and J. A. Gwynne.

The Minutes of the last meeting were read and passed.

Kalthuritty Flag Station.—Read Agent's letter of August 2nd, and it was resolved that the Honorary Secretary be asked to write the D. T. S. asking if he would kindly consent to meet a member of this Association next time he came to Thenmalai, to discuss the matter.

U. P. A. S. I.—Read telegram to Secretary, U. P. A. S. I. sent by Honorary Secretary which reads as follows: " We regret we are unable to send Delegate this year and would undertake to pay the two annas per acre subscription for five years if the new scientific scheme goes through and hope that the South Travancore experimental station is put in this District. We have got both Tea and Rubber, we could give them land alongside the Railway either under cultivation or jungle. Secretary, South Travancore," which was confirmed at present Meeting subject to Proprietors not refusing.

Read letter from Mundakayam Planters' Association *re.* registration of carts and vehicles. It was decided that this Association should co-operate.

(Signed) T. P. M. ALEXANDER, *Hony. Secretary.*

NOTES.

The Committee of users of dyes appointed to confer with the Board of Trade as to a national dye scheme has come to a unanimous decision in favour of the adoption of a scheme which differs in certain important respects from those of the scheme previously made public. The proposal is to form a company with an initial share capital of £2,000,000, of which £1,000,000 will be issued in the first instance. The Government will make to the company a loan for twenty-five years, corresponding to the amount of share capital subscribed up to a total of £1,000,000, and a smaller proportion beyond that total. The Government advance will bear interest at 4 per cent. per annum, payable only out of net profits, the interest to be cumulative only after the first five years. In addition, and with the desire of promoting research, the Government has undertaken for a period of ten years to make a grant to the company for the purposes of experimental and laboratory work up to an amount not exceeding in the aggregate £100,000. The modified scheme has been received with more approval from users of dyes in Leeds and the district than the original scheme, and the feeling appears to be general that it will meet with a considerable measure of success. The grant for scientific research in connection with the manufacture of dyes is a particularly satisfactory provision of the new scheme.—*Nature.*

RUBBER.

Leaf-Fall of Hevea.

Preliminary note in connection with the Investigation of the Secondary Leaf-Fall of Hevea brasiliensis in South India.

On plantations of *Hevea Brasiliensis* in Travancore and Cochin, and also according to report in Malabar, besides the ordinary seasonal leaf-fall which occurs in the early months of the year, a second leaf-fall occurs in July and August during the monsoon. The gusts of wind at this time bring down such showers of leaves that the phenomenon well deserves the name of leaf-fall. Not all the leaves fall, during the second leaf-fall as they do during the first, but still the mass of foliage on the trees looks decidedly thin and the ground within ten days of the first leaves beginning to fall has a thick covering of fallen leaves. Some trees shed more leaves than others. One may be almost bare while another may have almost its full stand of leaves. Such a second leaf-fall is apparently unknown in Ceylon and Malay.

2. Several ideas have been advanced to explain the occurrence such as that it is a physiological response on the part of the tree to its climatic conditions, chiefly to the large rainfall which is from 30 to 40 inches in July, or that it is due to a definite disease-causing organism.

3. An investigation has been begun in the Mycological laboratory at Coimbatore in connection with second leaf-fall and this year a parasitic fungus has been commonly found on various parts of the tree. This fungus agrees in its characters with that called *Phytophthora Faberi* by Maublane and *Phytophthora Theobromae* by Coleman. It has been found on the fruits, the green blades of the leaflets, the stalks of the leaflets, the main stalks of leaves, the young branches, and on the thin bark that is growing over the part of the stem that has been recently tapped.

4. On the surface of young fruits small areas take on a dull water-logged appearance, become sunk below the general surface level and subsequently assume a dark tint. Several may unite to form large irregular patches. The young fruits split but do not shed their seeds and remain hanging by their stalks. The surfaces of the spots ultimately become covered with a grey powdery mass which consists of sporangia (spore-cases of the fungus). Thin slices, or sections, looked at under a microscope show a non-septate mycelium ramifying both inside the cells and in the spaces between them and being in direct conection with the sporangia. (The mycelium is the name given to the mass of threads of which a fungus plant is composed. Each thread is called a hypha and these hyphae are said to be non-septate when they have no cross walls dividing them into compartments.)

5. The young tender leaflets become flaccid and curl up irregularly. On their surfaces are scattered grey masses of sporangia. Even the leaves in the bud are infected and become covered with thease groups of sporangia. On the more mature leaflets small or large greyish discoloured areas occur distributed anywhere on the leaf surface. Along the margins of the spots, on the under surfaces of the leaflets, grey powdery masses of sporangia occur, while in close connection with the veins towards the centre of the spot tiny drops of latex exude. Sections showed the same non-septate branching mycelium of the fungus in the tissue of the leaflet as well as in the vascular buudles and it was in direct connection with the sporangia.

6. Portions of the stalks of the leaflets and of the main stalk of the leaf become discoloured, assuming first a light, then a darker tint of brown. Sometimes the whole stalk is affected. Drops of latex appear on the discoloured areas. Sections again showed the same non-septate mycelium of the fungus but no sporangia. However, on putting the stalk in a sterile tube with a little sterile water sporangia were produced in two days.

7. The ends of young branches that produce the young infected leaves mentioned in para 5 assume a dark water-logged appearance, become soft, and rot. On drying the infected part shrinks. Sections show non-septate mycelia in all the tissues of the branch. Sporangia, however, have not yet been found in this position.

8. During very rainy weather, when the trunk is streaming wet, a slight darkening of the newly forming bark may be seen on the tapped area a little above the tapping cut. The bark is soft and rotten and it is said that the rotting may extend inwards and interfere with the fresh formation of bark. When the trunk becomes dry grey masses of sporangia appear on the surface. Sections showed the same non-septate mycelium of the fungus in the rotten tissue in connection with the sporangia. Regarding this form of rot it has been found by experience in Mundakayam that it can be effectively checked by putting with the thumb a thin smear of a mixture of tar and tallow over the affected portion.

9. Thus the same fungus has been found in all these different parts mentioned producing on the surface its sporangia (or seed-cases). It has been brought into pure culture on potato, carrot agar, and French bean agar. In the culture tube it looks like a little mass of cotton wool. This is the mycelium, the body of the fungus. On little branches attached to the threads of this mycelium very small round things (like minute transparent, colourless glass beads) can be seen by means of a hand lens. Looked at under the microscope they appear as pear-shaped bodies full of a granular substance. Each one is called a sporangium and it contains spores, which are the seeds by which the fungus reproduces itself. When placed in a few drops of water and the water is changed once or twice the end of the sporangium opens and several little spores emerge and swim about. After a time each swimming spore comes to rest and produces a thread which, if it gets on a suitable place on a Hevea plant, bores into the plant, uses the food inside the plant, and produces the disease symptoms already mentioned. With the fact that the spores or seeds can swim is associated the fact that the disease caused by this fungus is more apparent during the monsoon rains, for then the spores can swim about in the rain water that streams over the trees.

Inoculation Experiments.

10. In order to prove that a pure culture of this fungus would infect healthy plants the following experiments were made on the estate :—

Experiment 1.—Three healthy Hevea plants about one year old were chosen. Suitable tubes with open ends were carefully pushed over the leaves so that the stalks of the leaves were inside the tubes and the green blades of the leaves outside. A tiny piece of mycelium having sporangia was placed in water on a glass slide. Several changes of water were given and the swimming spores emerged. A drop of water containing swimming spores only was placed on the leaf-stalk inside the tube. Both ends of the tube were plugged with cotton wool, the inside layer of which

was moistened. All this was done to ensure that no other spores would get in to the leaf- stalk and also to keep the air inside the tube moist. In two days the portion of the stalk of the leaf where the swimming spores had been placed was discoloured and had drops of latex. Under the microscope it showed the characteristic non-septate mycelium and sporangia. Three other leaf-stalks were treated in the same way and produced the same result. Two others were treated similarly except that no swimming spores were put on them. They were the controls to prove whether enclosing the leaf-stalks in tubes did not also produce the effect. They remained healthy. Thus it was the mycelium produced from the swimming spores that caused the spots to be formed.

Experiment 2.—A seedling Hevea was put under a glass jar and a drop of water containing swimming spores was placed on the surface of one of the leaflets. In 3 days a discoloured patch appeared where the drop was put. Sections showed the characteristic non-septate mycelium inside the leaflet. No other leaflet was affected.

Experiment 3.— A seedling Hevea was placed under another glass jar and a drop of water containing swimming spores was placed at the junction of the stalks of 3 leaflets. After 3 days the leaflets drooped and then dropped off one by one. The leaflets of none of the other leaves did so.

11. These observations and experiments prove that *Phytophthora Faberi*, as it was called by Maublane, or *Phytophthora Theobromae* by Coleman, is parasitic on the leaf-stalks and leaves of *Hevea brasiliensis*. Other similar experiments are in progress to prove whether it is also parasitic on the fruits, stems, and new-forming bark and the results of these will be communicated in the next note. From Petch's recorded observations, and those noted above, there is really no doubt but that it is parasitic on these parts, still inoculations experiments with pure cultures will prove the case unassailably.

12. *Our experiments do not, however, prove that this fungus is the cause of the second leaf-fall.* Very much more work will have to be done before the cause is clearly demonstrated. That this fungus occurs on the leaves, however, is suggestive and the investigation of the subject will be continued. I would like to get all available information concerning this second leaf-fall from the planters' point of view, and Mr. Anstead, the Scientific Officer to the United Planters' Association of Southern India, has kindly consented to gather it. Perhaps planters particularly interested would communicate their observations to him.

13. Mr. Petch, the Government Botanist and Mycologist in Ceylon, some years ago noted this fungus, *Phytophthora Faberi*, as the cause of the disease of Hevea fruits and it was his work that suggested the search for this fungus on Hevea trees. This is, however, the first time that the fungus has been brought into pure culture on artificial media from Hevea and proved by experiment with such pure cultures to be parasitic on that plant.

WILLIAM McRAE,
Government Mycologist,
S. SUNDARARAMAN,
Assistant Mycologist,

RUBBER TRADE ASSOCIATION OF LONDON.

MONTHLY STATISTICS,

No. 4.

IMPORTS of all kinds of Rubber into the United Kingdom.

From	July. 1915.	July. 1914.*	July. 1913.*	Seven Months ended July. 1915	Seven Months ended July. 1914.*	Seven Months ended July. 1913*
Straits Settlements and Federated Malay States ...	2,485	2,399	1,711	25,953	16,909	13,471
Ceylon ...	385	612	384	8,317	4,176	3,108
British India ...	53	—	—	819	—	—
Dutch East Indies ...	249	—	—	1,542	—	—
Brazil and Peru ...	865	661	877	8,955	9,634	12,088
Africa ...	389	29	73	2,230	427	1,389
Other Countries ...	133	1,232	1,828	1,226	9,367	11,288
Total Tons ...	4,559	4,933	4,873	49,042	40,513	41,344

EXPORTS of all kinds of Rubber from the United Kingdom.

To	July. 1915.	July. 1914.*	July. 1913.*	Seven Months ended July. 1915.	Seven Months ended July. 1914.*	Seven Months ended July. 1913.*
Russia ...	306	363	391	6,544	4,119	3,929
Germany ...	—	1,172	695	—	6,781	6,315
Belgium ...	—	172	143	—	1,351	1,134
France ...	788	554	392	4,005	4,132	2,800
United States ...	3,733	958	1,421	25,490	13,992	9,325
Other Countries ...	711	367	229	5,073	2,446	2,159
Total Tons...	5,538	3,586	3,271	41,112	32,821	25,662

* Including Waste and Reclaimed Rubber.

IMPORTS, DELIVERIES AND STOCKS in London and Liverpool, July, 1915.

		Imports. For July.	Deliveries. For July.	Stocks 31st July. 1915.	Stocks 31st July. 1914.	Stocks 31st July. 1913.
London	Plantation ...	4,365	5,378	4,745	3,251	2,920
	Other kinds ...	50	129	464	756	935
	Total Tons ...	4,415	5,507	5,209	4,007	3,855
Liverpool	Para ...	207	584	946	630	1,103
	Other kinds ...	169	342	451	934	1,283
	Total Tons ...	376	926	1,397	1,564	2,386
Total Tons for London & Liverpool ...		4,791	6,433	6,606	5,571	6,241

Shipments from Straits Settlements and F. M. S.

	June.			Six Months ended June.		
	1915.	1914.	1913.	1915.	1914.	1913.
Tons ...	5,652	3,786	2,817	34,799	22,356	15,294

Shipments from Ceylon.

To	*June.	Six Months ended June. 1915.	1914.	1913.	1912.
United Kingdom ...	521				
Russia ...	20				
Germany ...	—				
Belgium ...	—				
France ...	23				
U. S. A. ...	394	8,609	6,970	4,578	2,316
Other Countries ...	28				
Total Tons...	986				

* Figures made up to June 28th.

U. S. A. Imports and Exports.

	May.			Five Months ended May.		
Imports.	1915.	1914.	1913.	1915.	1914.	1913.
India rubber ...	7,299	7,264	3,844	38,500	29,737	22,759
Gutta and Balata ...	567	1,519	2,961	5,137	5,267	10,970
Total Tons...	7,866	8,783	6,805	43,637	35,004	33,729
Exports.						
India rubber ...	91	202	193	1,072	874	1,047
Gutta and Balata ...	65	10	6	256	40	38
Total Tons...	156	212	199	1,328	914	1,085

Para Receipts.

	July, 1915.	July, 1914.
Rubber	1,060	1,040
Caucho	230	330

6, Mincing Lane,
16th August, 1915.

TEA.

Indian Tea.—Only 4,700 packages were offered at public sale. There was a steady demand and prices were fully maintained. In some cases a rather dearer tendency was noticeable, but not much interest was taken in a selection of second-hand old season's tippy Teas, the majority of which was withdrawn. There was very little to be had in leaf kinds under 11¾d. per lb. A few invoices of new season's Darjeelings were included, and very full prices were realized, The quality was fairly average, but the Teas were somewhat thin pointless. For next week about 10,000 packages are in type. At the sale held in Calcutta on June 22, about 20,000 packages were sold. All grades were in strong demand, and the lowest descriptions were dearer. The exports to the United Kingdom for the first half of June were 5,205,000 lbs,, against 4,390,000 lbs 1914.

Java Tea.—An unusually large quantity was offered on Thursday when over 10,000 packages were brought forward. The tone was very strong and late rates were fully maintained. In comparison with Indians and Ceylons, however, the quality obtainable is particularly attractive, more especially among Broken Pekoes between 1*s.* and 1*s.* 1*d.* These descriptions are well worth the attention of the trade.

Ceylon Tea.—The smaller amount brought forward at the auctions on Tuesday met with strong support, and with an active demand for Teas up to 1*s.* 0½*d.*, the market was mostly dearer. Full prices were paid for the better liquoring Pekoes and Orange Pekoes, and there was less obtainable under 11¾*d.* Broken Pekoes were in request generally, and rates frequently advanced. Dusts and Fannings were unchanged. At the public sales 27,908 packages were offered, nearly all of which were sold.

China Tea.—There is no change in this market and prices remain firm, especially for common leaf Teas. A fair business has been done in clean Monings under 10*d.* but the fine and finest grades have been slow of sale. Attention has been given to new season's Teas "to arrive," but the number of contracts made has only been limited as the majority of buyers prefer to wait for the bulk.

LONDON TEA MARKET.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended June 19 ...	5,931,229	3,856,975	947,012	724,839
For 25 weeks ended June 19 ...	137,686,447	148,304,409	25,269,088	27,289,681

—*The Produce Markets' Review.*

FEDERATED MALAY STATES.

RUBBER EXPORTS DURING JUNE, 1915.

The following figures of the exports of cultivated rubber from the Federated Malay States during the month and six months ended 30th June, 1915, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for 1914 being added for purposes of comparison :—

	1914.	1915.
	Tons.	Tons.
June	2,306	3,403
January—June	13,850	19,190

—*The Board of Trade Journal.*

CORRESPONDENCE.

Yendayar Estate, Mundakayam,
1st September, 1915.

Bangalore Meeting.

THE EDITOR,
Planters' Chronicle.

Sir,—The Hon'ble Mr. Barber's report was published in the *Madras Mail*, also in the *Planters' Chronicle*, but only a few lines were given in the former to the debate on my objections to it. It may interest non-subscribers to the Labour Department to know that I withdrew my resolution, not because I was satisfied with the Hon'ble Mr. Barber's reply, but because there was nothing to be gained in insisting on the resolution being put to the Meeting as I had good reason to believe it would not be supported. I said that in my district no under hand work had been done against the Department, and that the proper way to put a stop to under hand work and plans to blackguard an individual would be for the Hon'ble Mr. Barber to give the Meeting full particulars.

As a result of conversations I had with the Hon'ble Mr. Barber, our Chairman, Mr. Brown, and other Delegates, I feel convinced that they will not tolerate unfair competition on the part of the Labour Department against non-subscribers. This does not mean that I have ever complained of unfair competition or that I think non-subscribers will never have to complain on this score. It is quite possible that we may at some future time have grievances against the Department, but I am confident that a patient and impartial hearing will always be given us at U. P. A. Meetings.

I think the procedure at the Annual Meeting, hallowed though it may be by custom, should be altered. I have not time at present to enter fully into this and also consider that it would be presumptuous for me to offer suggestions to men who have attended these Meetings regularly for years. Rule X certainly should either be strictly adhered to or cancelled altogether. The rule was presumably made so that Delegates could be given instructions on contentious subjects by their respective local Associations. At present it appears to be a dead letter.

The U. P. A. holds a license only from the Government of Madras. I would like it to apply for licenses from Travancore and Cochin also. It could then have a registered office at Quilon or Alleppey and, taking the place of the Combined Travancore Associations, might hold an Annual Meeting there to deal with our local affairs. Planters living under the Government of Madras are able to apply through the U. P. A. for redress of their local grievances, but Travancore and Cochin men cannot do so, and this gives rise to the complaint that the U. P. A. is of little or no use to Travancore and Cochin.

This letter is already much longer than I intended it to be and there remains one other matter I desire to mention. It is the question of Unity which it seems to me Mr. Richardson and the Hon'ble Mr. Barber look upon in a wrong light. Let us by all means be united when attacked from outside, but if in all other cases we are to play the game of "follow the leader," the U. P. A. will soon cease to be a real live help to planters. Just as a bad pain about the belt lets a man know that he has dined well but not wisely, so internal opposition helps to keep the functions of a body like the U. P. A. healthy and vigorous.

Yours faithfully,

J. J. MURPHY.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 38.] SEPTEMBER 18, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The " Pricking of Rubber Trees" is extracted from *The India Rubber Journal* as also " Overseas Trade" in July.

For the Comparative Table of Movements of Tea for the past three years we are indebted to the *Indian Planters' Gazette.*

Coming so soon after Doctor Coleman's interesting lecture at the last Annual General Meeting on Green Bug, Ants and Borers, the Burrowing of Animals—borers that wend their way even through rock, which we reproduce from *the Scientific American* will be read with general interest.

The Director of the Labour Department has sent us two short notices for insertion. We congratulate the European Officers of the Department on the concessions granted them by Messrs. Spencer & Co. " May good digestion wait on appetite,'

We noticed in last night's telegrams the name of Major W. L. Crawford, Lincolns, of South Mysore amongst the wounded. We trust it is not serious and that he will speedily recover.

Mr. N. G. B. Kirwan, of the Bababudin Planters' Association, has joined the I. A. R. O. and has proceeded to Quetta for training.

SOUTH INDIA PLANTERS' WAR FUND.

Amount previously subscribed ...	...	Rs. 11,600	0 0
Mr. R. Ross ...	...	... „ 100	0 0
Messrs. Barber and Pascoe ...	...	... „ 75	0 0
		Rs. 11.775	0 0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed ...	...	Rs. 1,072	8 0
Mr. J. G. H. Crawford ,, ...	...	... „ 50	0 0
Mr. Thammayya ...	...	... „ 25	0 0
Mr. K. Subbayya ...	...	... „ 5	0 0
Mr. J. Stuart ...	...	... „ 100	0 0
	Total...	Rs. 1,252	8 0

CEYLON AGRICULTURAL STATISTICS.

The Ceylon Blue Book for 1914 has just come to hand from which the following statistics have been extracted in the hope that they may prove of interest to planters and be a handy form of reference in the future.

The total area of Ceylon is 25,331 square miles, and in 1914 there were 2,526,583 acres under cultivation, and 778,563 acres under pasture. A total of 3,663,351 acres was uncultivated out of which 1,073,457 are waste lands incapable of being rendered productive and unfit for pasturage. It would thus appear that the area which is not cultivated though fit for cultivation, 2,589,894 acres is a little more than the total area cultivated. In fact only about half of the land in Ceylon which might be put under cultivation is so used.

The population of the Island in 1914 was 4,106,350. The total number of births was 162,177 and of deaths 136, 831.

The following are the total areas under the chief different crops cultivated in the Island in acres:—

Paddy	...	685,147	Cotton	...	219
Other grain	...	130,314	Tea	...	486,536
Coffee	...	913	Tobacco	...	12,841
Cacao	...	34,129	Cinchona	...	100
Cinnamon	...	46,133	Rubber	...	168,178

The actual distribution of these areas is shown in the following table:—

Province & District.	Tea.	Rubber.	Rubber and Tea.	Rubber & Coconuts.	Coconuts.	Coffee.	Cardamoms.	Cinchona.
1. WESTERN PROV—								
Colombo ...	799	7,383	4,041	175	284,809	...	...	...
Kalutara ...	18,043	51,469	6,427	...	49,115	...	...	...
2. CENTRAL PROV—								
Kandy ...	168,313	1,803	...	...	11,858	141	517	100
Matale ...	19,500	30,000	...	...	5,750	50	900	...
Nuwara Eliya ...	129,307	...	...	...	404	105	1,006	...
3. SOUTHERN PROV—								
Galle ...	13,300	...	...	...	52,928	...	...	...
Hambantota ...	...	...	...	...	19,142	...	...	...
Matara ...	7,264	1,010	...	...	39,967	15	...	...
4. NORTHERN PROV—								
Jaffna ...	...	...	...	...	19,229	...	...	...
Mannar ...	...	...	...	...	3,652	...	...	...
Mullaittiva ...	...	...	...	...	2,164	...	...	...

Province & District.	Tea.	Rubber.	Rubber and Tea.	Rubber & Coconuts.	Coconuts.	Coffee.	Cardamoms.	Cinchona.
5. EASTERN PROV—								
Batticaloa ...	...	...	...	...	32,968	...	...	...
Trincomalee ...	...	...	...	...	3,781	...	...	...
6. NORTH-WESTERN PROV—								
Kurunegala ...	900	5,420	...	...	227,556	...	...	...
Pattalam ...	...	...	...	...	59,116	...	...	...
Chilan ...	...	...	...	...	105,323	...	...	...
7. NORTH CENTRAL PROV—								
Anuradhapura ...	...	125	...	...	2,825	...	...	...
8. PROVINCE OF UVA—								
Badulla ...	63,144	10,356	...	...	4,163	539	35	...
9. PROVINCE OF SABARAGAMUWA—								
Ratnapura ...	25,765	23,753	...	...	10,590	22	354	...
Kegalla ...	40,111	36,106	37,829	...	40,165	41	378	...

The following quantities of agricultural products were exported from Ceylon during 1914 :—

Tea ...	... 193,583,502 lbs.
Coffee ...	... 299 cwts.
Cinchona Bark	... 4,141 lbs.
Rubber ...	... 34,353,099 lbs.

The number of immigrants from India to Ceylon during 1914 was 78,662 and of Emigrants from Ceylon to India 49,031.

R. D. A.

In the *Revue generale des Sciences* (Vol. XXV., p. 777), M. Louis Brunet discusses the position of the combatant nations as regards the power of obtaining supplies of the metals copper, zinc, lead, tin, nickel, and mercury, which play so important a part in modern warfare. The conclusion reached is, that the position of the Franco-Anglo-Russian alliance is far better than that of the central European Empires, not so much on account of the greater producing power of the alliance, but owing to its mastery of the sea, which has enabled the English and French fleets to prevent in large measure the importation of metals declared "contraband of war" from neutral countries into Germany and Austria.—*Nature.*

RUBBER.

Pricking of Rubber Trees.

During the last ten years many experiments have been made with implements designed to incise the latex tubes of Hevea brasiliensis. It has long been recognised that the one great disadvantage of the present excision or paring method lies in the absolute destruction of living bark, which in its turn necessitates the renewal of bark at the expense of store material in the plant. If latex could be obtained by mere pricking of the latex tubes and no damage be done to the cambium, a fairly ideal method of extraction would have been evolved. Ceylon has taken the lead in experiments of this kind, though other trials have been made in Java, Malaya, and South India, with implements designed to effect the same purpose. The pricking method has also been applied to Manihot trees in Africa and various parts of the East. Judging from after effects one can certainly say that no ideal pricking method has yet been evolved for Hevea. Remarkable growths are noticeable on all trees which have been so tapped and for the present one can only give publicity to the work done, without making any definite recommendation for pricking instead of paring on estates.

Below we give an account of pricking experiments made in Ceylon with the " Bamber" and " Northway" implements.

The Bamber Pricker.

Tapping with the Bamber pricker was begun in April, 1910, on a plot which contained 147 trees of average girth 15 in. This instrument consists essentially of an oblong piece of wood, in which are fixed six knife points, each half-an-inch broad, rounded at their ends ; they are arranged parallel to and vertically above one another, and one inch apart. A shallow vertical channel is made in the outer bark from a height of six feet down to the ground, and transverse incisions, one inch apart, are made from the top to the bottom of the channel by placing the pricker along the channel and driving in the blades by striking it with a mallet, the operation being repeated until the base of the channel is reached.

In case it is desired to institute a comparison with the tapping of the experiments on one-third circumference, etc., by ordinary methods, it must be noted that these pricker experiments, which involve a two-monthly period, enjoy an advantage over the others in the following respect. In each two months, the first month includes tappings on all the trees, while the second includes only a few tappings on the largest trees. Therefore, the first month's tapping provides the bulk of the yield, and the second only a comparatively small amount.

As these trees were tapped all round every two months, or in some cases every month, this pricker system must be regarded as a drastic one. At the end of the first two months the maximum *square* of uninjured bark which it would be possible to find on the lowest six (or three) feet of the stem would not exceed one square inch. But as the ends of the pricker blades are rounded, it is claimed that uninjured strips are left overlying the cambium mid-way between the vertical channels, and that these are sufficient to provide for the transport of food down the system.

Although accurate measurements are not possible, it would seem that the trees have suffered more under this than under ordinary tapping methods, as judged by the size of their crowns, which appear smaller than those of the trees on neighbouring plots.

A notable phenomenon on many of the trees is the formation of swellings encircling the stem, especially in the upper part of the tapping area. These swellings are about six inches apart, a fact which appears to indicate that their position is dependent upon the length of the tapping instrument.

The girth measurements of the trees at a height of three feet do not indicate any marked retardation of growth, the most striking feature of the trees tapped by this method being the sudden decrease in girth immediately above the tapped area. From this it may be concluded that from 19 to 34 per cent. of the increase in girth is due to the effect of tapping, *i.e.*, to the formation of wound wood owing to the injuries to the cambium.

This conclusion is supported by the results of an examination of the stem. The fibres of the new wood are, in great part, contorted, instead of vertical, and thus exhibit the characters of wound wood. A cross section of the stem shows numerous short brown lines, arranged in concentric circles, each indicating where the pricker penetrated to the wood, and if the surface of the wood is carefully pared away it is seen that what appears as a line in the cross section is a vertical patch of dead tissue on the original surface of the wood.

Apart from the extra demand on the reserves of the tree to provide for the formation of wound wood, two important physiological disturbances results from this wounding. The contorted wound wood is not as efficient in conducting water up the stem as normal wood, and the dead patches in the wood prevent the radial movement of food, from its storage place in the wood, to the cambium, where it is required for the formation of new wood and bark.

It will be evident that on physiological grounds, this system cannot be recommended, while, from the practical standpoint, the high percentage of scrap will generally be regarded as a disadvantage.

The Northway Pricker.

Experiment I.

An experiment with the Northway serrated knife was begun on 25 trees in January, 1912. The average girth of the trees was 24 inches.

A shallow channel was cut from a height of five feet down to the base. Oblique incisions were then made along this channel, herring-bone fashion, at a distance of one foot apart, and alternately on opposite sides of it. The length of an oblique incision was $1\frac{1}{2}$ inch, equal to that of the knife. Two days later new incisions were made on alternate days until the area bordering the channel had been completely tapped. A new channel was then made about two inches from the first, and the process continued.

On this system the whole of the stem was not completed until the end of January, 1914. The yield per tree for the two years January, 1912, to December, 1913 was 495 grams in the first year and 692 in the second. The percentage of scrap for the whole period was 31 per cent.

It is evident that this system compares very unfavourably with other methods, whether judged by yield per annum, yield from a given area, or bark consumption.

Experiment II.

In August, 1912, a further experiment was begun with this instrument on two rows, one of 25 and one of 23 trees of approximately the same girth as in Experiment I. In this case the trees were tapped daily, and the pattern was full herring-bone, with five V's, instead of five alternating single cuts. It will be seen that by this method the bark would be worked over four times as rapidly as in the former, if the cuts were the same distance apart. The daily cuts were made one inch apart at the beginning, but the distance was changed to three-quarters-of-an-inch later.

Tapping was completed at the end of April, 1913, or in seven-and-a-half months, allowing for a rest of six weeks in February to March. As the cuts were then not properly healed, the trees were not re-tapped.

The yield per tree of the first set was 679 grams; that of the second set 667 grams. The percentages of scrap were 26 and 29 respectively.

The yield per tapping by this method was 15 per cent. less than by the slower method, and the total yield from the whole tappable area 43.3 per cent. less. It was obtained in one-third of the time, but the trees could not be immediately re-tapped.—*The India Rubber Journal.*

OVERSEAS TRADE IN JULY.

RUBBER BY QUANTITY.

Imports of Rubber*	1913.	1914.	1915.
From Dutch East Indies (Centals of 100 lbs)...	N. S.	N. S.	5,572
,, French West Africa	920	224	1,487
,, Gold Coast	727	423	480
,, Other Countries in Africa ...	N. S.	N. S.	6,763
,, Peru	1,126	1,150	414
,, Brazil	18,522	13,255	18,981
,, British India	N. S.	N. S.	1,191
,, Straits Settlements and Dependencies, including Labuan ...	21,818	39,738	36,303
,, Federated Malay States ...	16,516	14,072	19,349
,, Ceylon and Dependencies ...	8,595	13,678	8,622
,, Other Countries ...	40,953	27,593	2,975
Total Imports ...	109,177	110,533	102,137

Re-Exports of Rubber.*	1913.	1914.	1915.
To Russia (Centals of 100 lbs) ...	8,763	8,124	6,855
,, Germany	15,577	26,256	...
,, Belgium	3,198	3,849	...
,, France	8,754	12,413	17,659
,, United States of America ...	31,143	21,464	83,613
,, Other Countries	5,129	8,221	15,938
Total Re-Exports ...	73,264	80,327	124,060

* Prior to 1915 these figures include waste and reclaimed rubber as well as raw rubber.—*The India-Rubber Journal.*

TEA.

Comparative Table of Movements of Tea for the past Three Years.

(According to the Board of Trade Returns.)

INDIA.

	Imports.		
	1915. lbs.	1914. lbs.	1913. lbs.
January	32,178,315	15,870,358	16,671,303
February	16,738,432	11,467,914	9,624,848
March	8,173,263	7,080,658	7,745,108
April	4,200,717	3,392,009	2,736,710
May	2,203,116	1,319,708	1,603,593
June	5,574,233	3,469,891	2,877,159
Six months	67,608,276	41,748,811	40,940,328

	Home Consumption.		
	1915. lbs.	1914. lbs.	1913. lbs.
January	18,452,184	17,137,085	15,543,743
February	20,456,424	14,896,398	13,672,079
March	26,810,043	14,078,492	12,914,717
April	22,844,197	12,732,593	17,417,421
May	9,258,767	16,976,111	16,186,942
June	8,894,648	13,389,453	12,252,396
Six months	106,716,263	89,210,132	87,987,619

	Imports.		
	1915. lbs.	1914. lbs.	1913. lbs.
July		13,317,344	8,527,905
August		19,610,950	21,492,186
September		27,696,891	31,486,616
October		12,450,669	36,008,680
November		33,828,614	35,120,982
December		55,650,074	30,439,495
Six months		162,554,542	163,075,864
Twelve months ...		203,326,306	203,459,657

	Home Consumption.		
	1915. lbs.	1914. lbs.	1913. lbs.
July		14,279,965	12,706,978
August		16,598,714	12,035,865
September		12,449,996	12,532,145
October		17,139,921	16,285,497
November		19,562,269	16,178,208
December		15,569,310	15,035,189
Six months		95,600,175	84,773,882
Twelve months ...		184,810,307	172,843,911

			Exports.		
		1915.	1914.	1913.
		lbs.	lbs.	lbs.
January	... ...	3,823,305	1,707,722	1,962,446
February	... ...	2,138,606	1,385,857	1,743,750
March	... ...	2,826,329	1,480,849	1,498,929
April	... ...	1,626,302	1,475,831	1,750,417
May	... ...	1,056,206	2,103,291	1,625,804
June	... ...	1,159,871	1,462.964	1,194,504
Six months	... ...	12,630.619	9,616.514	9.775,850

		Stock at end of each month.		
		1915.	1914.	1913.
January	... ...	96,379,000	97,900,000	92,458,000
February	... ...	90,217,000	92,575,000	86,393,000
March	... ...	66,803,000	83,715,000	79,363,000
April	... ...	45,609,000	72,906,000	62,890,000
May	... ...	36,579,000	54,972,000	46,093,000
June	... ...	30,567,000	43.560.000	35,653.000
Six months	... ...	—	—	—

			Exports.	
		1915.	1914,	1913.
July	... ...		1,191,751	1,498,532
August	... ...		939,823	1,764,974
September	... ...		2,505,615	2,143,320
October	... ...		8,411,258	2,918,885
November	... ...		6,032,665	1,997,620
December	... ...		1,796.965	1,730,963
Six months	... ...		20,878.077	12,054,294
Twelve months	...		30,494,591	21,829,974

		Stock at end of each month.		
		1915.	1914.	1913.
July	... ...		41,247,000	29,921,000
August	... ...		43,091,000	37,573,000
September	... ...		55,320,000	54,438,000
October	... ...		41,482,000	70,651,000
November	... ...		48,586.000	87,646,000
December	... ...		86.574.000	10.191.000
Six months	... ...		—	--
Twelve months	...		—	—

* Adjusted.

Deliveries of Indian tea including Exports from 1st July, 1914 to 30th June, 1915 were 235,825,000 lbs., or at the rate of 19,652,000 lbs. per month.

Deliveries of Indian tea including Exports from 1st July, 1913 to 30th June, 1914 were 195,655,000 lbs., or at the rate of 16,305,000 lbs. per month.

Deliveries of Indian tea including Exports. from 1st July, 1912 to 30th June, 1913 were 19,124,000 lbs., or at the rate of 15,937,000 lbs. per month.

STOCK OF ALL TEA IN BOND ON 30TH JUNE.

1915.	1914.	1913.
79,617,000 lbs.	77,436,000 lbs.	77,099,000 lbs.

GEO. WHITE & Co., *Tea Brokers*,
31, Fenchurch Street, E. C.

—*The Indian Planters' Gazette.*

BURROWING ANIMALS.

Borers that wend their way even through Rock.

By Percy Collins.

Burrowing animals constitute one of those natural groups whose members, irrespective of their true affinity, are bound together by similarity of habit. They are found in all the more important divisions of the animal kingdom. Many instances might be cited from among the mammals, the reptiles and the birds, but the most striking engineering feats are performed by certain of the invertebrates.

We will take as our first example the mollusc known to fishermen as the piddock. Its scientific name is *Pholas*, but its two-valved shell has been given the pretty, popular name of "angel's wings," the reason being perfectly obvious after a glance at the creature itself. Now, the mollusc which resides in this gaping shell is very much like an oyster or a clam, so far as its bodily aspect is concerned. It seems to be very flabby, and very much lacking in what we term "brain power." Yet this tenant of the "angel's wings" is capable of burrowing into hard rock, sinking downward gradually as its shell grows, just as though it were merely working itself into sand. As most people know, a great many kinds of shellfish burrow into sand, and this habit renders them safe from many enemies. Certain fishes, however, plough up the sand and crack and eat all the molluscs they can discover. And it is probable that the persecution of these fishes, or rather, of their ancestors, brought about the rock-tunneling habits of the piddocks. Sand burrows were unsafe. Hence the piddocks began to burrow into rocks and stones instead. Commencing in youth, they pass the whole of their lives in working their way into these hard-grained substances, and are thus able to set their would be enemies at defiance.

As it works its way into the rock the piddock becomes a life-long prisoner in its own tunnel. Increasing in size, it works its way deeper, the hole gradually becoming larger. But as the lower part of the piddock's shell is much greater in circumference than the upper, and as the creature is constantly growing, the entrance of its tunnel is soon too small to admit of its egress. This, however, does not matter to the piddock, whose sole concern is to hide. It takes all its food in solution. In other words, it sucks in sea-water through one tube, and discharges it through another, relying for its sustenance upon the minute scraps of foodstuff that chance to be in the wafer around it. Thus the piddock is quite happy and content in its self-made dungeon.

Another marine tunneler nearly related to the piddock is the Teredo, or "shipworm." This creature works its way into wood; not rotten wood, but good solid oak or teak. In past years it was a menace to the shipping of the whole world, but the advent of the steel ship put a limit to its depredations. Still, it menaces submerged timber of all kinds, if unprotected, and in Holland, it is regarded almost as a national danger. Like the piddock, the shipworm makes its tunnels wholly for protection, for it does not feed upon the wood-chips which it rasps away.

No one—not even men of science—can tell excatly how the piddock and the shipworm accomplish their wonderful boring feats. Some have thought that the work was done by means of constant rasping, produced by the movment of the shell; others, that the fleshy, muscular "foot" of the animal respresented the chief tool; while still others have held that the

constant action of the water, pumped, as it were, through the body of the mollusc against the sides of its crypt, effected the gradual enlargement necessary as the creature increased in size. As a matter of fact, it is highly probable that a combination of all these means render the shipworm and the piddock the expert tunnelers that we see them to be.

One point about the shipworm's tunnels is of especial interest. It is that they are lined with a layer of hard, shelly material in exactly the same way that human engineers line their borings with stone or brick work, or with a tube of steel. This shelly lining prevents the wood from swelling and bulging inward, and insures the free passage of water along the tunnel. This is very necessary; for, as we have seen, the shipworm relies upon a constant supply of sea-water in order to feed. And as its tunnels are often of great length, it must make sure that no stoppage shall occur, or else run the risk of being starved to death.

A much thicker shelly lining is constructed by a cousin of the shipworm, known as Cyphus. It makes long tunnels, not in wood, but in the sand of the sea-bottom. Thus, if it did not construct a reliable casing within its burrow, it would very soon be cut off by a "fall" of sand behind it and perish like a miner imprisoned by a sudden subsidence of rock or coal. In fact, the shipworm and the Cyphus "shore up" the sides of their tunnels in exactly the manner which modern engineers agree to be the best - namely, by constructing a tube within the boring as the work progresses.

These shelly tubes are sometimes dug out of the sand by the South Sea Islanders in sections varying from four to six feet long and are valued highly by the finders as charms. They are placed above the doorposts of the huts. Vertical shafts are sunk by certain molluscs termed Aspergilium; and these, too, are lined with shelly material. The tops are roofed over in a very pretty way, the edge being frilled and the covering studded with holes like the rose of a watering-pot. In this way undesirable intruders are kept out, while a free passage for water is preserved.

Among insects, we find an extraordinary number of larval forms that are fitted for burrowing. The most interesting are the wood-borers, many of which are able to drive long tunnels into the hardest timber. They subsist upon the fragments of wood which they rasp away with their powerful jaws. Of course these same jaws are the tools with which the actual work of burrowing is accomplished; but the methods by which the soft-bodied animal obtains its purchase and maintains its surprisingly rapid advance, are very imperfectly understood. Some of these larvae (*e.g.*, those of the *Lucanidoe* or Stag-beetles) have a curious sickle-shaped form, the hinder end of the body being curved downward beneath the head, where it acts as a lever by means of which the insect is thrust forward. But the cylindrical larvae, such as those of the *Cerambycidoe* or long-horn beetles, must gain their leverage by muscular expansion of their body-segments acting upon the walls of the burrow. In each case, however, the details call for further investigation.

The grubs of long-horn beetles play an important part in virgin forests by attacking the trunks of dead and dying trees, which they soon reduce to pulp. In this way they not only break down the effete organic matter, but rapidly return it to the soil, where it acts as manure to new generations of plant life. It has been said that but for the activities of these and other wood-feeding grubs, all natural forests would gradually become blocked up with dead timber. But from the standpoint of forestry,

the majority of wood-boring insects must be regarded as pests, although their powers to injure have probably been somewhat exaggerated in the past, since many of the species confine their attacks to dead or sickly trees.

The great family *Scolytidoe* (popularly termed bark beetles) has of late years been closely studied, and their economy proves to be of great interest. Some genera are monogamous, while others are polygamous, and this distinction is indicated by the characteristic markings which each species leaves upon the surface of the wood, immediately beneath the bark. In the case of a monogamous species, the female, after hibernation, scoops out a small chamber in the bark of a suitable tree. She then takes a short flight and returns with a mate, pairing taking place within, or close to, the chamber. The female now sets to work in earnest drilling a long, straight tunnel between the bark and wood, and depositing her eggs along it to right and left alternately. When the grubs hatch, each eats its way outward more or less at right angles to the "mother gallery," and when full-fed pupates at the end of its burrow. In this way curious and beautiful patterns are traced upon the surface of the wood. It has been found, moreover, that the particular angle made by the junction of the larval with the maternal galleries differs in the respective species, and is thus serviceable as a means of identification.

In polygamous species, the male first excavates a roughly circular chamber beneath the bark, and therein receives from four to six females. After pairing, the females construct their respective tunnels, which all radiate from the nuptial chamber; and as the grubs in their turn bore outward from the egg-tunnel at all angles, very complicated patterns usually result.—*Scientific American.*

Is there to be another Valorization?

The prospects of a large crop and the loss of the German and Austrian markets by the war embargo have led the Brazilian Government and its State of Sao Paulo to resort again, it is reported, to the so-called valorization plan for the protection of their coffee planters. Dispatches from Rio de Janeiro, say that at the request of Sao Paulo, the Brazil Congress has ordered an issue of about $97,000,000 paper currency, half of which is to be used in buying and withdrawing from the market a large part of the new coffee crop, up to 4,000,000 bags. The first valorization, following the record high crop of 1906-1907—23,800,000 bags—caused a continuous disturbance of the coffee trade for five years, though there is no gainsaying the fact that for a time its operation seemed to be the salvation of the coffee interests of this country. Of course, no second coffee valorization scheme can be participated in directly by anyone in this country, as was the case with the first. When something like Brazil's plan was proposed last year for the relief and protection of our cotton growers, officers of our Government who advocated the plan were reminded of the Sherman Act suit, brought during the operation of the first coffee valorization scheme, against agents and representatives of Brazil, and the proposal dissipated into thin air. The coffee trade in general in this country want no repetition of their experience with valorization, and Brazil's depressed financial condition would hardly seem to be able to stand the extra burden of this vast issue of paper notes.—*Simmons' Spice Mill.*

LABOUR DEPARTMENT.

The Director of the Department intends to make a preliminary tour in the Telegu districts from the 16th to the 25th September, to visit the country being worked by Messrs. Walton and Bartels, who have got in touch with new connections of coolies for Estates in Mysore and Coorg which want them. The work has borne its first fruits and the Director will make more definite arrangements for its continuance on sound lines, which is the object of his visit. On the 27th, he will be at Bangalore. On the 28th, he will start for Chickmagalur, and visit a few Estates where Telegu labour is wanted. On the 3rd October, he will return to Bangalore. During his absence correspondence should be addressed as usual to Bangalore, but urgent and personal matters which can catch him between 28th September and 2nd October at Chickmagalur may be addressed to the Kadur Club, Chickmagalur. He hopes that Subscribers who wish to see him will take advantage of his short stay at Chickmagalur.

The Director of the Labour Department acknowledges with thanks the kindness of Messrs. Spencer & Co., Ltd., in granting Concession tickets for Meals at all their Refreshment Rooms and Dining Cars on the Railways served by them, for the use of all the European Officers of the Department.

Coffee.

Only comparatively small quantities of coffee have been offered at sale, and prices have been steady at recent rates. It is generally expected that some of the restrictions on exports will shortly be removed, in which case values will probably harden. Although the market is rather dull, many possibilities engage the attention of those who are interested in the future of the trade. The recent temperance legislation and the influx of French and Belgian refugees have both tended to increase the consumption of coffee. Millions of young men, in training, and on active service, are acquiring the "Coffee habit," in camp and in the cafés on the Continent. The grocer never had such an opportunity to foster his coffee trade, so many propitious circumstances prepared the ground for him. Coffee is a thoroughly wholesome beverage, and owing to its delicious flavour and stimulating properties it is an ideal beverage for combating intemperance.

London Coffee Returns.

	Home* Consumption.		Export.		Stock.	
	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.
For week ended August 14 ...	246	300	150	44	29,335	21,797
For 33 weeks ended Aug. 14..	13,258	9,925	17,763	18,364	—	—

*The Home amount contains a proportion for Export delivered by cart.

—*The Produce Markets' Review.*

Missing No 39

' Chronicle.

THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 40.] OCTOBER 2, 1915. [PRICE AS. 8,

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Officer returned to Head Quarters yesterday from his tour in the Nilgiris.

We publish some information on "Coffee in Brazil" taken from the Diplomatic and Consular Reports.

We print the proceedings of the Anamalai and Coorg Planters' Associations.

In the *Chronicle* of 25th September the number of Estates subscribing to the North Mysore Planters' Association was given as 19. This should read 49.

SOUTH INDIAN PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	13,065	0	0
Mr. W. Barnard	10	0	0
Mr. A. H. Robb	15	0	0
Mr. E. F. Foster	50	0	0
Mrs. H. A. Marshall	100	0	0
Mr. H. Allardice	300	0	0
Mr. R. Harley	300	0	0
Total Rs...	13,840	0	0

OVERSEAS AIRCRAFT FUND.

Account previously subscribed	1,547	8	0
Mrs.. H. A. Marshall	100	0	0
Mr. N. M. Scholfield	75	0	0
Mr. A. F. Magniac	75	0	0
Mr. E. W. Duncan	30	0	0
Mr. W. R. Wright	100	0	0
Total Rs...	2,927	8	0

Members of District Associations who have joined the Army.

Coorg Planters' Association.—Lieut. M. B. Pollard-Urquhart, Horse Transport Depot, Park Royal, N. W. A. J. L. O'Beirne, Oxfordshire Yeomanry, attached to 9th Lancers.

Knan Devan Planters' Association.—P. Gordon, 6, Bruntsfield Crescent, Edinburgh, Scotland.

AGRICULTURAL STATISTICS.

Coffee in Brazil.

The following information with regard to the exports of Coffee and Rubber from Brazil has been extracted from the *Diplomatic and Consular Report* (*No.* 5451) *for* 1912-13.

The amount of valorised coffee remaining at the end of 1911 was 5,101,468 sacks. In 1912 a further 723,565 sacks were sold and there remained 4,377,903 sacks. The sale realised £2,533,877 and the surtax of 5fr. on exported coffee during the year amounted to £1,812,619. The interest and amortisation were duly paid on the foreign loans contracted for valorisation purposes; £78,280 was repaid on the Federal Government loan of £3,000,000 which was thus reduced to £2,490,544. On the big loan of £15 millions, £3,270,000 was paid back and the amount still unredeemed was £4,577,080. The banks had a further sum of £1,210,000 in hand in 1913 towards redemption during the year. At the beginning of 1913, 1,235,678 more sacks were sold, the amount deposited in foreign ports being reduced to 3,142,225 sacks. The United States Government in May 1912 instituted an action to condemn as contrary to the trust laws the sale of coffee in the United States under the Sao Paulo valorisation scheme, and at the same time an embargo was placed on the supply of valorisation coffee stored with the Dry Dock Co., of New York. This was subsequently removed by the New York judges as the legality of the measure was open to doubt. The feeling, however, in the United States against valorisation coffee did not subside but the Government did not return to the attack during the past year, mainly owing to the action of the Sao Paulo Government last January in disposing of all valorisation stocks held in the United States.

With the decline of valorisation the question of increasing the area of plantations is once more brought to the fore. It was part of the valorisation scheme to prohibit, under severe penalties, fresh plantations of coffee, but these prohibitive measures have to a certain extent been relaxed during the past year. Many of the plantations in Sao Paulo, Minas Geraes, and Rio de Janeiro are growing old and in a few years' time their production will begin to wane. On one estate, for instance, many of the trees are quite 40 years old and all that fresh plantation has done, in spite of excellent management, is to maintain production at a stationary figure. The average age of trees in the State of Sao Paulo cannot be much under 25 years; in some parts it is over 30 years.

In spite of valorisation new areas are being brought under cultivation. In the State of Parana a new coffee zone, covering an area of 1,600 square miles will in four or five years' time yield a large surplus for export. In the State of Sao Paulo planting has begun in districts served by the new railways.

The importance of the coffee industry to Brazil is seen from the fact that two-thirds of the total exports for 1912-13 were accounted for by coffee alone, and Brazil continues to contribute roughly three-fourths of the world's production of coffee as will be seen from the following figure:—

Year.	Production of Brazil. Sacks.	Production of other countries. Sacks.	Total. Sacks.
1910—11 ...	10,848,000	3,676,000	14,524,000
1911—12 ...	13,037,000	4,337,000	17,374,000
1912—13 ...	12,131,000	4,275,000	16,406,000

This Brazilian coffee was distributed to other countries as follows:—

	1911 Sacks.	1912 Sacks.
United States ...	4,444,973	5,092,661
Germany ...	1,803,991	1,820,407
Netherlands ...	1,413,412	1,183,255
Austria-Hungary ...	967,677	957,886
France ...	874,928	1,187,268
Belgium ...	338.723	405,583
United Kingdom ...	270,114	171,201

The most noteworthy item is the increased importation by France which rose from the fifth place in 1911 to the third place in 1912 as an importing country. The proposal for lowering the import duty brought forward in the Chamber of Deputies in 1912 and subsequently referred to the Tariff Commission will, if successful, tend to increase the French imports of Brazilian coffee.

R. D. A.

GOLD COAST.

Timber and Rubber Exports in 1914.

A supplementary issue of the Gold Coast *Government Gazette* of 13th May publishes the following figures showing the quantity and value of the exports of timber and rubber from the Colony during the years 1910 to 1914:—

Year.	Timber. Quantity Ft.	Timber. Value. £.	Rubber. Quantity. Lbs.	Rubber. Value £.
1910 ...	14,938,749	148,122	3,223,365	385,875
1911 ...	13,973,396	138,821	2,668,667	219,447
1912 ...	23,573,651	228,745	1,990,699	168,729
1913 ...	37.391,848	369,305	1,287,942	87,978
1914 ...	24,587,217	240,880	654,133	21,632

The large decrease in the export of rubber is due to the low price being offered and the inferior method of preparation. It is doubtful if the indigenous rubber will again command a price which will pay the native his tapping and transport expenses, owing to the ever-increasing quantities of well-prepared plantation rubber now being put on the market.—*The Board of Trade Journal.*

ICED COFFEE.

Directions.

(60 *Cups to the Pound,*)

Iced Coffee—Hotel Style.—Make the coffee as usual boiled or drip), fill a mug or cup half full of crushed ice; pour the hot coffee on ice until cup is full, sweeten with sugar. When cold a small piece of lemon or orange may be added.

The use of cream or milk is a matter of individual taste.

Iced Coffee—Home Style.—Make the coffee as usual (boiled or drip) strain the liquid coffee into a pitcher and place same into an ice box to chill, serve; to half-glass of liquid coffee add half glass of ice water; sweeten with sugar. A small piece of lemon or orange may be added. —*Simmons' Spice Mill.*

DISTRICT PLANTERS' ASSOCIATIONS.

The Anamalai Planters' Association.

Minutes of an Extraordinary General Meeting held at the Club at 2 p.m., on September 15th, 1915.

PRESENT.—Messrs. Congreve (Chairman), Hatton Robinson, Lloyd, Behr, Moxon, Jones, Robb, Cooper, House, Carless, Simcock, and Cotton (Honorary Secretary). *Visitor*: E. H. F. Day, Esq.,

The minutes of the last meeting were read and confirmed and it was decided to send a reminder to the D. P. W. regarding the condition of the roads and other matters referred to in the Association's letter of July 9th.

MINOR FOREST PRODUCE.—The Honorary Secretary was instructed to write to the Collector and District Forest Officer, asking that in future all correspondence should be sent to Mr. J. Carless, Mukothumudi Estate.

HOSPITAL SITE.—The Honorary Secretary was instructed to address the Collector again with reference to the deduction of the area of the road in payment for the felling.

MEDICAL AFFAIRS.—It was decided to address the District Medical Officer with a view to ascertaining the qualifications, terms of service, &c., of the present Sub-Assistant Surgeon, giving details of a serious case occurring on 14th instant with which he was incapable of dealing.

It was also decided to enquire of the P. W. D. the reason of delay in construction of the hospital and the date by which it may be expected to be open.

BANGALORE DELEGATES' REPORT. SCIENTIFIC DEPARTMENT.—It was proposed by Mr. Congreve and seconded by Mr. Robb, that Messrs. Robinson, Simcock and Cotton form a Committee to address the U.P.A.S.I. on the subject of the treatment of this Association in this connection.

The Delegates' Report was read and adopted for private circulation, and a vote of thanks passed to the Delegates.

It was resolved to allot Rs.300 towards the Delegates' expenses to Bangalore.

DISTRICT ADVERTISEMENT.—The Hon. Secretary was instructed to obtain tenders for the taking of suitable photographs, working in connection with the Labour Department; each estate to choose what photos it wants taken and all photos to be submitted to the Labour Committee for selection.

WESTERN OUTLET.—Read the Cochin Dewan's letter of 28th July and reply to same. It was decided to send a reminder on the subject.

POST & TELEGRAPH.—It was decided to ask the Post Master General the reason of delay in construction, stating that temporary quarters can be provided immediately on the present site at Valparai, conditionally upon the removal of the wire to the new site as soon as the building is completed. and reminding him that the telegraph guarantee has now been in his hands for some months. It was also decided to send a copy of the letter to the Post Master General, to the Planting Member.

S. I. P. WAR FUND.—The Honorary Secretary was instructed to write the Secretary, U. P. A. S. I. for more circulars.

At the meeting a sum of Rs.750 in donations and monthly payments amounting to Rs. 65 per month to the end of the War were promised.

POLLACHI TRAVELLERS' BUNGALOW.—The state of the Pollachi Travellers' Bungalow having been discussed, it was proposed by Mr. Robb and seconded by Mr. Carless that the Local Board's attention be drawn to the fact that the local Fund Travellers' Bungalow in Pollachi is in a disgraceful condition as regards cleanliness and furniture and that as it is a first class Bungalow the Board be requested to put matters right immediately and provide an adequate supply of furniture and other necessaries, and to suggest to the Board that as planters from this District are constant users of this bungalow—their comfort might reasonably be studied in the above respects.

GHAUT ROAD.—It was decided to address the D. P. W. again on this subject.

NEW MEMBERS.—The following new members were elected :—

Mr. C. K. Pittock proposed by Mr. Robinson and seconded by Mr. Congreve.

Mr. J. R. Moxon proposed by Mr. Robb and seconded by Mr. House.

Mr. R. H. Ferguson proposed by Mr. Carless and seconded by Mr. Scott.

LOCAL LABOUR LAWS.—The existing Labour Laws were discussed and it was resolved that they should be properly tabulated, reviewed and amended by the existing Labour Committee. It was decided to ask the advice of other Associations on the subject.

CONTINUANCE OF A. P. A. OR OTHERWISE.—It was proposed by Mr. Simcock and seconded by Mr. Robb that the A. P. A. employ a Shorthand Typist Clerk capable of undertaking the correspondence of the A. P. A. under the guidance of the Honorary Secretary and that the members of the Anamalai Club be approached as to whether they would contribute a share of his salary in return for his services as club writer. A vote of thanks was passed to Mr. Simcock for his offer of a house for the clerk.

LABOUR LAWS.—Resolved that an extraordinary general meeting be called within a month from this date to discuss rates of pay. It was proposed from the chair and seconded by Mr. Simcock : "That the rates of "pay current in the district to be binding on all members of the A. P. A. "shall be Annas 5 per man and Annas 3½ per woman for all contracts to "work after April 1916 and that advances be limited to Rs.10 per head for "tamil coolies, provided that the Mundakayam Planters' Association will "agree to reduce their present rates similarly."

With a vote of thanks to the Chair the meeting closed.

(Signed) C. R. T. CONGREVE,
Chairman.

(„) A. C. COTTON,
Honorary Secretary.

Coorg Planters' Association.

Minutes of the Quarterly General Meeting held at the Bamboo Club, September 16th, 1915.

PRESENT.—Messrs. W. M. Ball (President), W. R. Wright, N. M. Scholfield, F. W. Gerrard, H. W. Sheldrick, G. W. L. Parsons, H. M. Mann, J. Hume, W. A. F. Bracken, A. H. Jackson, G. L. Newbery, A. J. Wright, E. Duncan, P. G. Tipping (Honorary Secretary).

1. Minutes of last General Meeting held in the North Coorg Club, Mercara, read and confirmed.

2. REPORT OF DELEGATES TO THE U. P. A. S. I. CONFERENCE:

Mr. Chairman and Gentlemen,—A Summary of the Proceedings of the U. P. A, S. I. Conference of this year appeared in the *Madras Mail* and other papers giving all who are interested an idea of what was done.

The matters dealt with which are of chief interest to us are the New Scientific Scheme, and the Labour Department. Two funds were also started, namely, the South India Planters' War Fund and the South India Planters' Aeroplane Fund, both of which are now in circulation.

The new Scientific Department Scheme was discussed; Mr. Chadwick the Director of Agriculture of the Madras Presidency, fully explained the position and the scheme for future development. The Delegates at the meeting were unanimous in their opinion that the generous offer of the Madras Government should be accepted. As the provision of Rs,10.000 per annum for 5 years will strain the U. P. A. S. I. funds to the utmost, a private guarantee fund was started and liberally subscribed to, it being pointed out that no calls would be made unless the U. P. A. S. I. funds fell below their present level, it was also suggested that individuals and firms interested in the planting industries of S. India be asked for subscriptions in aid of this Department, this suggestion did not meet with very strong support.

LABOUR DEPARTMENT.—In his very satisfactory report of development and work done since August, 1914, Mr. Aylmer Martin makes a very strong appeal to all those interested in Labour and the planting industries of S. India to seize this unique opportunity in the history of our industry to get at the root of all our labour troubles; the first and most important step is *Combination in the limitation of Advances.* Now is our time for taking the advance question really seriously. The Department has already done much good work and with our united help will, there can be no doubt, more than repay the outlay.

RAILWAYS.—Your Delegates supported the Cochin Harbour and Wynaad Railway Scheme in accordance with instructions.

Many other matters were dealt with but nothing of much importance so far as this Province is concerned. If there are any questions that the Meeting would like to ask, we shall do our best to answer.

(Signed) G. R. PEARSE,
(„) P. G. TIPPING, } Delegates.

The Report being adopted Mr. Jackson seconded by Mr. Bracken proposed a hearty vote of thanks to the Delegates, carried unanimously.

3. SCIENTIFIC DEPARTMENT.—A number of questions were asked and a discussion ensued regarding details of the new Scheme. Mr. A. H. Jackson seconded by Mr. A. J. Wright then proposed "That no payments, other than those already sanctioned, be made from the Scientific Officer's Reserve Fund without the consent of the subscribers."— Carried.

4. LABOUR DEPARTMENT. LIMITATION OF ADVANCES.—It was agreed that members of this Association should endeavour to limit individual cooly advances to Rs.10.

5. CORRESPONDENCE ON THE SUBJECT OF AN ENHANCED POSTAL SUBSIDY TO SECURE A MOTOR MAIL SERVICE.—The Commissioner of Coorg informed the Honorary Secretary that this was dependent on an accelerated train service.

6. CORRESPONDENCE RE. ESTABLISHMENT OF TELEGRAPH OFFICES AT MARKUT AND SAMPAJI.—The Postmaster-General has this matter under favourable consideration.

7. CORRESPONDENCE WITH EUROPEAN ASSOCIATION.—The C. P. A. is not eligible for membership as an Association. Rules, list of members and papers laid on the table.

8. CUMBLIES. With a view to counteract the steady annual increase in rates charged by local merchants the Honorary Secretary whilst in Bangalore saw several merchants, and hopes to arrange for samples and tenders about January—Feberary, 1916, if a sufficient number send in their names and requirements to make the experiment worth trying.

9. S. I. PLANTERS' WAR FUND, S. I. PLANTERS' AEROPLANE FUND AND SCIENTIFIC DEPARTMENT GUARANTEE FUND.—Subscription lists were circulated at the Meeting.

10. The Honorary Secretary gave outline of Mr. J. G. Hamilton's tour in Coorg for the information of those who might wish to see him about labour or other matters.

11. A hearty vote of thanks to the Chair terminated the Meeting.

(Signed) PERCY G. TIPPING,
Honorary Secretary,
C. P. A.

A CHEAP WHITEWASH.

The Department of Agriculture of New South Wales recommends the following as a cheap whitewash which will stand the rain and weather without coming off, and will do for galvanised iron :—Place enough tallow required for the purpose in a large bucket, then lay about the same quantity of good lime (dry) on top of the tallow—*i.e.*, equal proportion of each ; then pour enough water on to slake the lime. When the heat from the lime has melted the tallow, and all is well dissolved, stir it thoroughly until all is well mixed ; then apply (warm, if possible) with a large brush. This will do for any surface. The surface must be quite dry before applying the mixture. If required to dry very white, add a small quantity of blue.—*Queensland Agricultural Journal.*

COFFEE.

Coffee Production in Guatemala.

AN UNUSUALLY INTERESTING TRIP RECOUNTED BY ERNEST ROE.

To all lovers of life in the open life in the sunshine and among green trees, a coffee finca is an ideal place, for coffee has the peculiarity of growing at its best only under conditions that make for all that is best in life—warmth, sunshine and a limited but certain amount of moisture; hence we find the coffee fincas of Guatemala situated in the best and healthiest places in that delightful country, in places high above sea level, where the air is dry and pure and where the air is cool though the sun is strong and bright. Though there are many parts of Guatemala which fulfill these conditions, none are better favoured than those on the Pacific slope for coffee growing, beauty and health.

From such a finca as the writer has in mind, 1,600 feet above the sea, the Pacific Ocean, over 40 miles away, can be distinctly seen beyond the plains nearer the coast, while in the opposite direction the volcanoes of Santa Maria and Zunil stand out as sharply against the sky as if they were only a few hundred yards away instead of the 10 or 12 miles they really are.

Not only are these distant views most beautiful but nearer at hand the bright, though varied, greens of the woods surrounding the finca make a picture that for green freshness would indeed be hard to surpass in any part of the world.

Coffee growing should be, from the open-air life it involves and the conditions under which the coffee grows, one of the healthiest occupations in the world; and so it is, but it is also one in which close application and constant attention are needed if success is to be attained. From the time the seed is chosen for growing the tiny plants to the time when the tree no longer gives a paying crop, supervision must never be relaxed or the crops will fall off and no longer make a profitable return.

First of all, sites must be chosen for the plantation and nursery and the ground planned out and prepared, the nursery having raised beds (or what is the equivalent, beds with deep trenches all round them) and the plantation having square holes dug at regular intervals to receive the young plants. The seed is carefully selected from the best berries of the best trees obtainable—unless this is done the plants will be irregular in size, and produce finally an irregular plantation. The seeds are sown at distances apart so that when the young plants have reached a suitable size each one can be cut out by itself, with the earth in which it has grown (the raised beds helping here), and transplanted in the ground prepared. This ground must be kept as clear as possible of weeds, which, as may well be imagined, grow luxuriantly and would, if left, quickly choke the plants and exhaust the soil; such trees are planted as will produce shade, without entirely obscuring the sun, in order to retain the moisture in the atmosphere and prevent the plants from being scorched by the heat of the noonday sun.

In two years the coffee will begin to produce a crop, but it does not reach maturity until about five years; then the full-grown trees will continue to bear for another 25 or 30 years.

Coffee trees in bloom make one of the most beautiful sights imaginable, the branches being covered with such masses of white blossom that the

whole plantation gives the effect of having suffered from a heavy fall of snow. Again when the coffee is ripe, a fine effect is produced by the red-brown berries glistening in the sun among the shining green leaves.

Coffee picking is, of course, the busiest season and extends, perhaps, over two months, usually November and December, but varying slightly in different localities. The work begins when the earliest berries are ripe and continues as the ripening goes on until the trees are bare of everything but their leaves. After picking, the coffee passes through various cleaning processes and is finally spread out in a large cement-paved yard to dry in the sun previous to being weighed into bags for shipment.

The drying process is one that needs close watching, as the coffee must be constantly naked and turned over in such a way as to insure that the drying shall be even and thorough, for, as in most other things, a maintained quality is of great importance in a coffee crop.

Scarcely has the last berry of one year's crop been picked before the young buds of the next appear – the trees seem to have a great vitality and never really lose their leaves, though the handling they undergo while picking is in progress may take off some of their bright green appearance.

Fertility of Soil.

It may seem strange to those who are accustomed in agricultural pursuits to regard a rotation of crops as being necessary if the soil is not to be impoverished, for coffee to bear abundantly for so many years, but it must be remembered that in dealing with Guatemala the agriculturist has peculiar advantages in regard to soil. A very large proportion of the whole country is covered, often to a considerable depth, with a volcanic ash that is particularly rich in all those chemical compounds that are so valuable to vegetable life; and the land having been until recently uncultivated has lost none of its properties, as the natural growths have, left to themselves, returned to the earth all they have taken from it, in the form of decomposed vegetable matter, as bringing all the richness to the surface and making the soil eminently suitable for the purpose to which it is now put. A handful of this soil shows a rich brown loam (turning black if moistened) with a small percentage of fine white sand, which mixture, being clear of small stones, is the very ideal from an agriculturalist's point of view.

With such a soil as this fertilisers are unnecessary, and if used at all should be selected with great care and only after exhaustive experiments have shown just in what manner they should be applied for a really beneficial effect to be produced. An injudicious use of fertilisers may have the effect of a temporary stimulant with all the evil after-effects that such stimulants usually have upon all forms of life, animal or vegetable.

Useful anywhere, a river is an asset of great value on a coffee finca. From it can be taken the water supply for the dwelling houses and rancheria, power for driving machinery in the carpenter's shop and for generating electricity. Water for irrigating purposes is also taken from such a river.

Although it is not usual to irrigate coffee, the shade trees being deemed sufficient to retain the moisture in the atmosphere in most cases, there are circumstances under which this plan may be adopted with advantage in a region where rain out of the wet season is almost unknown. This may occur when starting a new plantation on open ground; shade trees of a suitable kind take some years to grow, while quick-growing plants like bananas

unduly impoverish the soil and if left will in time ruin the crop. Hence, a certain amount of moisture being necessary, irrigation provides a ready solution to what might be a difficult problem, granted of course that the coffee is of a variety sufficiently sturdy to stand the direct rays of the sun.

Electric light is used on many Guatemala fincas; it is a great blessing for not only does it make for convenience, cleanliness, comfort, health and economy, but when a busy season renders night work necessary, it helps materially in getting this work done, for as all who have had experience in such matters know, a man will do twice as much work in a bright light as he will in a dim one.

Life on a finca, though for many reasons an ideal one, is, however, not without troubles and difficulties. The fincero, cut off from the society of his own kind, must not only be an expert on the subject of coffee, but must also be an organiser and a diplomat, a mechanic and a civil engineer, a doctor, a lawyer and a financier—he must be prepared to deal with anything that may turn up, and many are the problems, practical and theoretical, that he has to solve.

It is quite a mistake to suppose that the Indian laborer (or mozo, as he is called) is badly treated or that he is poor because his pay, converted into dollars and cents, is small. It is to the fincero's own interest to treat his people well and to keep them happy and contented; the work is better done and it is easier to keep the men; if they were really harshly used they would simply leave the finca—and no one could prevent them. As regards pay, it must be remembered that the rate of pay in one country can never be taken as a standard for judging that in others where conditions are totally different; the Indian's wants are few and the food on which he lives is given to him free. Nor has the depreciation of the nominal value of the currency affected the mozo adversely, for his pay has increased in proportion and has not, as many suppose, remained stationary.

Coffee is the most important product of Guatemala and in it centres the interest of all classes. Broadly speaking, it is raised principally in a strip extending across the country from Mexico to Salvador on the Pacific slope, between the altitudes of 1,000 and 4,000 feet, although there is another smaller region in central Guatemala known as the Alta Verapaz, or Coban, where a berry of very high grade is produced. There are no available complete statistics showing the total amount produced, but export figures indicate the relative yearly production, as the amount consumed at home may be assumed to be fairly constant.

Coffee growing in Guatemala has always been a bonanza, for though the amount exported is relatively small compared to that of Brazil, the excellence of the quality has enabled the produce of this country to command high prices, thus bringing in a good return for capital invested.—*Simmons' Spice Mill.*

STRAITS SETTLEMENTS.

Rubber Exports, July, 1915.

According to telegraphic information received by the Malay States Information Agency, the exports of rubber from the Straits Settlements for the month of July amounted to 2,324 tons, as compared with 2,249 tons in June, and 1,584 tons in July, 1914. (These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Java, Sumatra and the Non-Federated Malay States).—*The Board of Trade Journal.*

CORRESPONDENCE.

Westward Ho!
High Ground,
Bangalore,
S. India.

Labour Department.

THE EDITOR,

The Planters' Chronicle,
Bangalore.

Dear Sir,—I cannot for the life of me think who *Vive et Vivas* can be. Subscribers to the Department in Peermade are not very numerous and of those but few correspond direct with me. Running down the list of names, I do not find a single one of my old acquaintances who were in the district when I paid my last visit to it. This fact and the Cocksure claim to knowledge of past events in Peermade which must be based on hearsay, coupled with the cheery tone of his letter (a positive relief in these days) leads me to think he must be youthful. Of my few Peermade correspondents none have made use of the Scottish expression referred to. I learnt it and many others on the High Range of Travancore when the vast majority of the population (bar Tamils) were Scotsmen. See how well they trained me! I say "Scottish" and "Scotsmen", and I was taught to say "Scotch" only when I meant whiskey, but now-a-days I never use this word, as following the example of the King, I only drink barley water.

As regards the Labour force in Peermade, I don't know what it was in 1860, but certainly in 1884 it was largely Malayali from Travancore though Tamils were present, and perhaps in nearly equal numbers. Bonami had a gang from Palni in the Madura district while Placard and Chenkra got some coolies from near Uttamapalayam in the Cumbum Valley. As regards the High Range labour, I must place something on record, in case I have to go off to the front soon with other men of my own age. In 1880 one Mr. Dickson, I forget his initials, brought a fine Trichinopoly gang from Ceylon with him to East Talliar, and when he left the district they were taken over by C. O. Master of Sothapara, who went home and left me in charge of the Estate. I took them afterwards to Nyamakad where at one time I had 600 of them. Not being able to feed them, I gave some to Kanniamallay and some to Periakanal. On transfer to Chittavurrai, I was not allowed to take my coolies with me, and as they would not remain behind, they dispersed, and I next heard of them at Anekal Estate *in Peermade*. They and their descendants are now mostly in the Malay Straits I believe.

John Payne in 1881-2 brought Tinnevelly coolies from Tenkasi and the South to West Talliar; they had been with him on Tekmallai Estate for years. A. W. Turner ran Devikulam mostly with a Mahommedan connection from Manjakuppam.

In 1882 and 1884 C. J. Sim followed by J. E. Fowler introduced the big Srivilliputtur Kanganies, who recruited mostly from Sankaranainarkoil and Puliangudy in the Tinnevelly district, to Ancimudi Estate, from their own Estates in S. Travancore.

The rest of us worked mostly with Bodi and Tevaram "varam" coolies. So that in what I may call "pre-Company" days, the High Range certainly did not get any Peermade connections. When the

big Company started, Daddy Williams brought Tinnevelly coolies who had worked with him in S. Travancore, to Chokanad. Harley senior brought a Peermade connection to Sevenmallay, but these were from the Andipatti side and not from Tinnevelly district. About that time the completion of the Periyar dam set free a horde of coolies some of whom took up work on the High Range and for all I know in Peermade. I only remember one gang under Suppany Kangany of Srivilliputtur who came to the High Range from Peermade.

I think I have said enough to show, that from wherever the High Range connections of Tinnevelly coolies originally came, they did not come from Peermade, but were legitimate expansions of the connections introduced by Payne, Sim, Fowler and Williams.

The big expansion of cultivation in Peermade started a little after that on the High Range, and I have no doubt Kanganies of one district got hold of coolies who had previously worked in the other, as alas! they still do. The advantage may have rested with the High Range, where higher advances were undoubtedly paid as *Vive et Vivas* says, but this is quite a different thing from saying that the High Range had no compunction in ousting Peermade from their recruiting districts. Personally I find those in Peermade in possession of old connections of Tinnevelly coolies, very well able to hold their own in their old centres. Does the High Range complain that Peermade is taking away their labour? Do they hold themselves up as Martyrs? Do they claim to be doing more than their duty? If so, I wish they would write to me instead of to *Vive et Vivas* who knows far more about these points apparently than I do.

The Labour Department of the U. P. A. S. I. was formed with several objects and one of them was to restrict advances. The High Range Estates are the first to work towards this object, not with any idea of earning the Martyr's crown, but from self interest. Another object of the Department is to try and control internal competition. These two objects are inseparably connected, and I ask *Vive et Vivas* to give his support and assistance in attaining these and all the other objects of the Department, without complaining or incurring Martyrdom, but from self interest.

May I ask, if a Peermade Kangany took an advance and failed to put in an appearance again but remained in Tinnevelly district how he was extradited? It seems rather illogical to put men in jail who performed part of their contract, while those who fail totally, go free. I can understand Peermade losing labour (if they have done so) under such circumstances and I am glad *Vive et Vivas* admits it to be a wrong system. The average advances in Peermade are lower than they are on the High Range, it will be less of an effort to fix them at Rs.12 in the former than in the latter district for Tinnevelly coolies. No one has suggested terms that are uneven. In looking to the past, let us be certain of the areas meant by "our old districts."

I must thank *Vive et Vivas* for his kindly words of appreciation, and to assure him that he and his labour force are entitled to all the assistance the Labour Department can lawfully give, and he will get it.

If his anonymity has brought on him unexpected things, I assure him nothing personal or unkind is meant.

Yours Faithfully,

AYLMER MARTIN.

30th September, 1915.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 41.] OCTOBER 9, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

The Director, Labour Department, asks us to publish a note to the effect that he will be absent from Bangalore from the 14th instant till the end of the month. He will visit Erode, Podanur, and Mangalore (at which place his address will be care of Messrs. Volkart's Bros., from the 17th to 23rd inclusive). Thence he proceeds to Pudukad in Cochin State and will try and get back to Bangalore on the 28th.

SOUTH INDIAN PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	13,840	0	0
Malabar Club Saturday Night	30	0	0
Mr. D. Elkington	100	0	0
Mr. W. F. Scholfield	150	0	0
Mr. M. J. Woodbridge	100	0	0
Mr. R. Lescher	25	0	0
Mrs. R. H. Morris	100	0	0
Mr. E. C. Walker	15	0	0
Total Rs...	14,360	0	0

OVERSEAS AIRCRAFT FUND.

	Rs.	A.	P.
Amount previously subscribed	2,927	8	0
Mr. D. Elkington	50	0	0
Mr. W. H. Duly	25	0	0
Mr. J. J. McKenzie	30	0	0
Mr. Muddura Belliappa	15	0	0
Mr. A. G. Nicholson	100	0	0
Mr. and Mrs. S. P. C. Raymond	50	0	0
Total Rs...	3,197	8	0

Members of District Associations who have joined the Army.

Coorg Planters' Association.—G. W. Breithaupt, Yorks, Pindi, C. R. Jessop, Yorks, Pindi. R. H. W. Smith, Yorks, Pindi.

Anamalai Planters' Association.—C. Howland, 2nd Lieut., A Supp'y and Transport, Maymyo, Upper Burma.

Shevaroy Planters' Association.—Edward Large, Manager of The Cauvery Peak Estate, Nagalur, is leaving for London, at his own expense in the "S. S. Arabia" to join the Aviation Corps.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Tour in the Nilgiris.

From 11th September to the end of the month I was on tour in the Nilgiris and had the pleasure of visiting the Daverashola district, Coonoor, Kotagiri and Ooty Districts, and seeing a number of estates, some of which I had not seen on former tours.

When I last visited the Nilgiris, in 1911, I advised that all Coffee badly attacked by disease, and reduced to a stage at which neither manure nor spraying would cause it to recover and grow good plants again, should be uprooted and replaced by Tea. I am gratified to find that this plan has been adopted to a large extent, and in place of more or less moribund Coffee, covered with Green Bug and Soot Fungus, one now sees flourishing Tea clearings. I am convinced that this is the best solution of the Green Bug problem is the Nilgiris - to replace old worn out and diseased Coffee by Tea and concentrate money, labour, and insecticides on the good Coffee to keep it free from diseases and up to a good yielding standard.

The fact that Coffee is being replaced by Tea over large areas has created a problem of its own. Old Coffee soils are apt to be sour and to have lost humus, while the physical condition of the soil is often such that it binds when wet and cakes hard when dry, and it is thus rather difficult to establish Tea in it.

It appears to me that the best plan to adopt in such cases is, first of all to take out all the old coffee stumps and the dead stumps of shade trees with as many roots as possible and burn them, and then to thoroughly lime and cultivate the soil. Big pits should then be made, only the very best and healthy plants from the nursery should be used, and these should be planted very carefully and not rammed tight. If the plants are rammed in such soil it puddles and the roots are suffocated for want of air, the tap root dies, and the side roots are confined to the pit, The consequence is that any temporary attack of scale insects, or other diseases, produces an abnormal effect, because the plants are already struggling with adverse conditions, and many of them die. Even those which survive develop such a poor root system that when they reach the stage at which they are pruned for the first time they are unable to recover from the shock and again there is a large proportion of vacancies.

Careful attention to the above points will guard against these troubles, but it implies good nurseries, and small clearings well planted. This will in the long run pay better than big clearings hastily planted from nurseries of insufficient size to permit of careful selection of the strongest and best plants only.

The initial removal of old stumps is important. Stump Rot is prevalent in the District and is apt to take heavy toll of young Tea clearings in their second and third year from planting. *Grevillea* (Silver Oak) so commonly used as a Coffee shade is especially dangerous. As has been noted before *Symplocos spicata* (known locally as 'Boothagani' is certain to produce Stump Rot in Tea, and it should be not only dug out with as many of its roots as possible before the Tea is planted, or as soon after that as possible, but the material should be removed from the fields and burned. Unfortunately much of the secondary jungle now being cleared for Tea is full of this tree. Here again small clearings properly cleaned will prove economical.

I was shown what is to me a new form of Root Fungus which has the effect of making the attacked portion of the stem and root a bright scarlet. This is under investigation. The treatment is the same in the case of all these Root Diseases and has been so often described in these pages that it is unnecessary for me to repeat the directions here.

After Tea is established on these soils it should be constantly cultivated and humus should be added to it by means of digging in green dressings. In the Nilgiris a number of suitable leguminous plants grow wild so that there should be no difficulty in establishing a cover. *Cassia wimosoides* several *Crotalarias*, *Desmodiums* and *Indigoferas* are common weeds. A common shrub *Sophora glauca* might be used in hedges along the edge of drains, or even as low wind belts, and kept lopped, the loppings being dug in. The best of all plants, however. for supplying humus is the *Dadap* and this grows with the greatest of ease at all the lower elevations in the Nilgiris. It should be planted every 20 feet throughout the Tea and kept lopped up, being cut twice a year ; once before the dry weather, when the loppings are laid on the ground between the rows of Tea to act as a mulch ; and again about September, when the loppings are dug in. When the Dadap has been in about three years and begun to get big its side roots should be cut and in the following year it should be uprooted and planted anew. When fertilisers are applied to these old coffee soils, Nitrogen should be supplied in the form of Organic manures such as Poonac or Fish, in conjunction with Phosphoric acid as Basic Slag, or similar basic forms of phosphate, and Potash as Sulphate of potash. If this treatment is carried out the tendency of the soils to cake in the dry weather will gradually disappear and a good mechanical condition will be restored.

Another problem about which I was consulted during my tour by many planters was that of the prevention of wash on the steeper slopes. This is most important, especially in Tea where constant cultivation is done and time and labour and money spent in producing a good tilth in the top foot or so of soil to which also manures are added. In this surface soil the bacteria abound and much of the plant food is manufactured so that it is most important not to lose it.

There are various ways of preventing wash and a judicious combination of them will reduce it to a minimum.

In the first place slopes should be drained along the contours, the drains being traced in so as to be at the right gradient to carry off the water gently. Silt pits may be made at intervals in such drains with advantage.

On very steep slopes a close-growing legume should be established, and in all cases on steep land surface rooted weeds such as Spanish Needle, Goat Weed, *Galinsoga*, &c., should be left, or at most grass knifed, during the monsoon so that their roots may hold up the soil. The fact that they may be taking up plant food from the soil does not matter, since this is restored again in a quickly available form when they are dug in before the dry weather to prevent their taking up moisture needed by the Tea. Along the edges of the contour drain a small hedge of *Crotalaria*, or *Sophora*, might be grown to hold up top soil and prevent it washing into them.

Again if all work in steep fields is done along the contours there is a tendency for the soil to form natural terraces and reduce wash to a minimum. The Tea in such fields should be weeded along the contours, dug along the contours, and plucked along the contours, instead of up and down the slope. If prunings are buried the trenches for this work should

be opened in alternate rows along the contours and the prunings buried in these with the upper layer placed with the brush-wood upper-most and about two inches of it left projecting from the soil when the trench is filled in. The pluckers walk on the other line and much of the fine soil washed and pushed down the slope is caught by the projecting brushwood and retained. At the next pruning season the other line is used and thus natural terraces are gradually formed.

I noticed that in some places great efforts are being made to plant up swamps with Tea, no doubt with the idea of rounding off and clearing up the estates. In some places the number of drains put in to get the soil in any condition for Tea made the place look like an entrenchment in Flanders, and even then the greatest difficulty was being experienced in getting the Tea established. Now in my opinion this sort of thing is uneconomical, and it is better to clean out the swamps and plant them full, either of Gums for firewood, or of *Dadap*, the latter being regularly cut and used as a mulch for the surrounding Tea. The practice of keeping swamps clean and planted with one crop instead of a mass of weeds and jungle is a sound one, since such places usually act as nurseries for diseases.

With regard to diseases the following were noticed;—

Yellow Bark Louse.—The Fish Oil Rosin Soap which was really designed for Green Bug on Coffee has turned out to be an excellent spray for this scale also. *Pink Mite*, and *Red Spider*, were slightly in evtdence, the usual remedies being applied.

Mosquito Blight I saw for the first time in the Nilgiris (though I have often been told it existed in the District I had never actually seen it before) on a small patch of Tea at one of the lower elevation estates. Catching of the insects and pruning out the affected tea with cleaning of the stems and burning of the prunings was recommended.

Stump Rot has been already mentioned. Several different Fungi are at work and the working out of the different species and assigning long names to them will no doubt prove an attractive problem for our Mycologist when we get him, which I hope will be as soon as the War is over. Obviously we cannot get one before, even were the Government willing to try, as only the slackers and unfit are left to recruit from.

Grey Blight and *Brown Blight* (*Pestalozzia Guepini and Colletotrichium camelliae*) These fungi on the leaves are much in evidence and the latter is causing a great deal of damage in same places, attacking the Tea even in nurseries and young clearings. During my tour the Government Mycologist, Mr. McRae, was good enough to arrange to meet me and investigate this disease. I hope before long to be able to publish some detailed particulars about it, and the precautions we advise for its control, in these pages.

Eelworms were noticed in a nursery. In such cases the attacked plants should be destroyed and the nursery not used again. If it is impossible to abandon the nursery site it should be thoroughly limed and disinfected before use again.

While on the subject of diseases I should like to call attention to the fact that in the towns of the districts, especially in Ootacamund, there appears to always be whenever I visit them a plague of Flies. Now it has

been satisfactorily proved that the Fly is the carrier of several diseases, particularly of typhoid, dysentery, and diarrhea, and a campaign is being conducted against Flies in all European countries. I do not know who is responsible for the insanitary conditions as regards Flies in the Nilgiris, possibly it may be the Gane Association, or possibly the Municipal authorities, but I venture to suggest that in the interests of science and the public health the Honorary Secretary of the Nilgiri Planters' Association should buy and present to the proper authority two cheap but most valuable and instructive books dealing with the Fly Pest, *viz.*, "Fighting the Fly Peril" by C. F. Plowman and W. F. Dearden (London, Fisher Unvin price one shilling) and "The House Fly: A Slayer of Man," by F. W. Fitz-Simons (London: Longman Green & Co., price one shilling.)

I fear that my friends the Nilgiri Coffee planters will find this report very dull reading, but I did not see very much Coffee during this tour. That which I did see had a small crop in common with most Coffee Districts this year, but looked very healthy with good wood and a promise of a good crop next year, given good blossom showers.

The season with its constant rain has been very unfavourable to Green Bug and has encouraged its parasitic fungi to grow through the dry weather. Now is the time to back up this check to the pest with manures and spraying so as to keep it under and raise the general standard of health of the Coffee.

I had an opportunity of attending a Meeting of the Nilgiri Planters' Association at Ootacamund on 27th September and addressing the members present and I returned to head-quarters on 1st October.

RUDOLPH D. ANSTEAD,
Planting Expert.

A useful article on the war and English chemical industry is contributed to the August *Fortnightly Review* by Mr. John B. C. Kershaw. A comparative analysis is given of the British and German exports of manufactured chemicals, showing that whereas the bulk of the British exports consist of heavy chemicals and "crude products," the German exports to this country, which have a value twice that of the British exports, consist mainly of fine chemicals, dyes, and pharmaceutical products. In the manufacture of the former a minimum of skilled labour and supervision is required, whilst in the German manufactures the opposite is the case. Mr. Kershaw again emphasises the fact that in Germany the directors and managers of chemical works are men whose business training has been superimposed on that obtained at a university, and who therefore have a thorough knowledge of the scientific side of the business, and realise the necessity for calling into their councils the best scientific and engineering knowledge available. One of the most important results of this is that they are not impatient of the time taken or success achieved by research work, and their knowledge of chemistry renders them less liable than inexperienced men to expect impossible results. A second factor of importance in the success of the Germans in the manufacture of fine chemicals is that resulting from the cleanliness, orderliness, and discipline of the German worker. This is attributed in no small part to the training gained during the period of military service. The article closes with a discussion of the prospects for the industry of fine chemicals and dyes in this country in the future, when the war has ended and the Germans again become active competitors. —*Nature.*

DISTRICT PLANTERS' ASSOCIATIONS.

Shevaroy Planters' Association.

Proceedings of the Annual General Meeting of the Shevaroy Planters' Association held at Victoria Rooms, Yercaud, on 24th September, 1915.

PRESENT.—Rev. Father Capelle, Messrs. S. M. Hight, C. G. Lechler, W. I. Lechler, K. Leeming, J. C. Large, C. Rahm, W. Rahm, G. Turner, and Charles Dickins (Honorary Secretary), *Visitor*: Mr. I. A. Lechler.

(1) The Notice calling the Meeting was taken as read.

(2) THE DELEGATE'S AND HONORARY SECRETARY'S REPORTS.—Mr. G. Turner, the Delegate to the U. P. A. S. I. Meeting, read his report as follows:—

I attended, as your Delegate, the 22nd Annual General Meeting of the U. P. A. S. I. held at Bangalore from the 16th to the 19th August, 1915. Besides the Executive, there were 20 Delegates present representing 13 Districts.

The Secretary's Annual Report, Chairman's Address, Work of the Planting Member, Scientific Officer's Report and the Labour Director's Report have all appeared in print, and do not require any special comments from me beyond that they are all full of interest and worthy of careful study.

I will now touch upon some of the most important items of the Agenda paper.

ROADS AND COMMUNICATIONS.—Under this heading I was instructed to ask the U. P. A. to place the matter of connecting up the Yercaud-Glazebrook Road with the top of the Manjavadi Bridlepath and the linking up of the Manjavadi Bridlepath with the Salem-Harur Cart Road before the Government of Madras for further consideration. Before moving my resolution, I fully explained the urgent necessity of getting these connections completed. The Hon'ble Mr. Barber, however, pointed out that there was not the *slightest* chance of our getting these roads finished unless the conditions of Government were complied with, and these are that the Salem District Board and the Shevaroy Planters' Association must contribute one-half of the cost. As, I understand, the planters on the Shevaroys are unwilling to provide any money, there is nothing more to be said, and the only chance of getting the roads finished is for the Estates interested to do the work themselves.

BEES AND POLLINATION OF COFFEE.—The only practical way of protecting bees is that suggested by Mr. C. D. McCarthy—namely that Estate Managers should communicate the bounadries of the adjoining Government lands which require protection, and then assist the Forest Department to put a stop to all interference with the combs of the bee.

I explained what this Association had done in the matter—that we had asked the Forest Department to give us protection over all the hills, and to make the gathering of honey and wax penal under the Forest Act. That in reply, the Forest Officer of South Salem had told us that honey and wax would not be sold in future in that portion of the Shevaroys which is included in Salem South: the leases expired on 30th June, and no fresh leases have been given.

I proposed a Resolution thanking the Government of Madras for the interest they have taken in the subject.

SCIENTIFIC DEPARTMENT.—It was decided, after careful scouting, that the U. P. A. had sufficient funds to enable it to make the yearly contribution of Rs.10,000 to the Government of Madras for the working of the Scientific Department.

It was, however, thought prudent to start a Guarantee Fund in case there should be any falling off in subscriptions, and planters have been asked to guarantee Rs. 150 each in any one year. The guarantors will not be called upon unless the working profit of the U. P. A. falls below Rs. 500. Rs. 2,300 was guaranteed at the Meeting, and I have been asked to try and obtain guarantors from among the members of this Association. I would ask our Honorary Secretary to circulate a notice, and appeal to members to become guarantors.

Government will now take over the Scientific Department and work it, but there will be no chance of getting a Mycologist until the war is over and little hope of the Department being fully organised till then.

ALIEN ENEMIES.—After I had left Yercaud for Bangalore I saw in the *Madras Mail* that the Government of India had at length issued a statement of their policy in regard to our enemy aliens. Such being the case the resolution which this Association asked me to move had to be modified and my remarks thereon considerably curtailed.

I thought perhaps a Resolution expressing firstly the satisfaction of the U. P. A. at the decision of the Government of India in their determination to repatriate all German and Austro-Hungarian women and children, together with men of non-military age, secondly, the hope that alien firms would be closed down would be acceptable to the Meeting. But after consultation with the Chairman and Planting Member it was thought that any such resolution would be premature, especially in regard to the closing down of hostile firms—so a Resolution supporting the action of the Madras Chamber of Commerce and the European Association was passed.

AGRICULTURAL MATTERS.—Under the heading "Pests" Dr. Coleman (Director of Agriculture in Mysore) gave a most interesting lecture upon Green Bug and Borer.

Dr. Coleman appealed especially to all planters to send him information about the borer insect.

He would like to know, among other things, (1) in what trees other than coffee does it exist (2) How many broods it has in the year. If any of you would send him this information it would tend to help the investigations he is now at work on about this pest.

RUBBER GROWERS' ASSOCIATION.—You will be asked to nominate a representative for this Association.

PLANTERS' BENEVOLENT FUND.—Our Honorary Secretary will be asked to push this Fund as much as he can and try and obtain more subscribers, for after the war is over calls upon the Fund are likely to be large. The subscriptions collected during the year ended 30th June were Rs. 1,955; Assistance was granted in 5 cases—amounting to Rs. 1,460. A sum of Rs. 16,477 stood invested on account of this Fund in 3½% Government Paper on 31st December, 1914.

PLANTERS' WAR FUND.—A War Fund known as "The South India Planters' War Fund" was started on the last day of the meeting. It had been established for the purpose of helping planters who have joined the Army or Navy, and the word "planter" covers employees of Mercantile Firms belonging to District Associations.

Our representative on the London Chamber of Commerce will be asked to act as Treasurer of the Fund in London, and an influential Committee is to be appointed.

The Executive of the Benevolent Fund will be asked to act as Treasurer in India, and a separate banking account will be opened.

It stands to the credit of the U. P. A. that a sum of Rs.10,860 was promised by the delegates alone at the meeting.

When the Subscription List comes round to this Association, I trust that excess of liberality, rather than the want of it, will be shown. I hope every member of this Association will put his name to the list and give a subscription according to his means. However small the subscription, it will be equally welcome as evidence that everyone is "doing his bit."

AN AEROPLANE FUND co-operating with the Overseas Club was also inaugurated. I hope you will not turn your back upon this Fund. It is started in a good cause and deserves the support of every planter. The Executive of the U. P. A. will receive and forward subscriptions.

I voted for Mr. C. H. Browne (N. Mysore) as Chairman and for Messrs. Waddington and Nicolls as Vice-Chairmen: and Mr. Richardson as a Member of the Control Committee of the Labour Department.

This, Gentlemen, closes my Report and if any one present desires to ask me any questions I shall do my best to answer them.

(Signed) GUY TURNER.

A hearty vote of thanks was accorded to Mr. Turner for the services rendered to the Association by him at Bangalore.

THE HONORARY SECRETARY'S REPORT.—Gentlemen,—In presenting my report for the year ending 31st August, 1915, I have not much to mention, as planting politics have been somewhat at a standstill and nothing of any importance has filtered through the channels of the Association during the year under review. We started the year with 36 members on the Roll and close with 31. Three members have left the Hills, (two are in France fighting our foes and one obtained an appointment in the Military Works in Central India). One Estate has been lost to us owing to the death of the owner, and one member resigned owing to other calls on his purse.

The Income of the Association for the year including a balance of Rs. 478-2-7 carried over from last year amounts to Rs,1,591-3-2 and the expenditure to Rs. 1,199-5-0, leaving a balance in hand of Rs.391-14-2. I arrive at these figures as follows: Balance from last year Rs. 478-2-7. Subscriptions from 29 subscribers at Rs.30 each Rs.870, subscription from 11 subscribers at Rs.10 each to the P. B. F. Rs.110. By sale of bamboo permits at 2 as. each Rs.16-10-0. From Messrs. Stanes & Co., Rs.71-6-7 being value of Triage and Refuse Coffee taken over by that Firm out of 121½ Bushels Parchment Coffee sent by the Shevaroy Planters to the Front and Rs.45 paid in from last year's outstandings. This brings the total of our income to Rs.1,591-3-2.

The Expenditure is as follows :—

Upkeep of office establishment and peons pay Rs.204, the cost of printing various notices and circulars in connection with the Association Rs.44-2-0. On account of transport to Salem Railway Station and watch for 121½ bushels Parchment Coffee Rs.11-12-0, subscription to Serbian Fund Rs.71-8-0, subscription to Victoria Rooms as per resolution passed at meeting of 5th July 1913, Rs.18-2-0. Subscription to P. B. Fund Rs.110-0-0. Subscription to the U. P. A. S. I. on 4,915 acres at 2 annas per acre Rs.614-6-0. Delegate's expenses to Bangalore Rs.100. The purchase of one copy of Mr. B. Fletcher's Book on Insects and Pests of S. India Rs. 6-14-0. Postage on account of Trea : Trans : P. Cards, wires, letters, reg. letters and stationery Rs.18-9-0. Total Rs.1,199-5-0, leaving a balance of Rs. 391-14-2 to the credit of the Association, besides which I have grass permits to the value of Rs.3-7-0. The outstandings due to the Association at the end of August 1915 amount to Rs.85 : 80 for year ending 1915 and Rs.5 for year 1914. If all the outstandings are paid in, and I see no reason why they should not be, we should have in hand Rs.476-14-2.

The Accounts have been in the hands of your auditors—Messrs. Turner and C. Rahm, who were appointed at the last General Meeting and I trust they will be able to certify to the correctness of the statements I have just made.

I would draw your attention to the dwindling state of our P. B. F. which has only 11 subscribers now, and trust that when there are not so many other calls on our purses as there are at present, this fund will again receive better support.

During the year under review we have had 10 meetings :—

On the	8th September	1914	the Annual General Meeting.
	10th November	,,	a Committee Meeting.
	8th December	,,	a Committee Meeting.
	18th December	,,	a Special General Meeting.
	6th January	1915	a Quarterly General Meeting.
	13th March	,,	a Special General Meeting.
	13th April	,,	a Special General Meeting.
	23rd April	,,	a Labour Committee Meeting.
	3rd June	,,	a Committee Meeting.
	8th July	,,	a Quarterly General Meeting.

All these meetings have been fairly well attended.

The Meeting held on 13th March was convened for the purpose of meeting Messrs. Martin and Day at which the former gentleman very kindly explained and answered the various questions put to him *re.* the Labour Department Rules, and on his assurance that should some of them be found inapplicable to this District, new ones could be substituted the meeting decided to adopt the rules. A standing Labour Committee was also elected, *viz.*, Mr. C. D. Ryle (to represent the Non-members) and Messrs. C. Dickins, C. Rahm, G. Turner and Revd. Father Capelle (to represent the Association) to whom disputes under the L. D. Rules should be referred. With reference to the Director's Report recently received he very strongly urges the necessity of fixing the amount of advance to be given per head, and I trust this important matter will receive the attention of the subscribers to the Labour Department. In fact I am of opinion that the matter should be taken up at once to be ready for next advance season.

At the instigation of the U. P. A. S. I. a subscription list was circulated during the month of December to all planters on the Shevaroys asking if they would kindly contribute coffee to the allied troops in France and Belgium—limiting the amount to one cwt. of parchment coffee each. 121½ bushels were very kindly contributed and the consignment was despatched to Messrs. Stanes & Co. for curing, then to the U. C. Growers Co., for roasting and tinning. Both the Firms did the necessary preparations free of all cost to us, and the Association duly acknowledged their kindness in fitting terms. The outturn in connection with the consignment was examined and found in order at meeting of 13th April and the amount Rs.71-6-7 realised by the sale of triage and refuse coffee was collected and sent to the Manager, *Madras Mail* on account of the Serbian Fund. The sum of Rs.300 was also collected by the Association on account of H. E. Lord Pentland's Madras War Fund and the amount sent to the Manager, Bank of Madras. The subscription list and Bank's acknowledgment were produced at meeting of 10th November and the names of the subscribers published in the P. C. of that date.

At the request of the Association, Government very kindly sent us 2 estimates for metalling the 1st 5 miles Yercaud to Craigmore Feeder Road, one for metalling the cart track of 7 feet along the whole of the 5 miles, and the other for completely metalling the road. Those interested in the road were asked to contribute something towards the cost. Several expressed their willingness to do so, but as two important estates which make considerable use of the road refused to join, the matter has been dropped for the present. The Association received a copy of Act VIII of 1912 from the Collector and District Magistrate, Salem, with reference to a list of birds to be protected on the Shevaroys. I had copies printed and on 20-1-15 I posted one to each member.

The subject of Bees and Coffee Pollination again came before this Association and with reference to a resolution passed at meeting of 3rd June asking the Forest Department to make the gathering of honey and wax penal under the Forest Act, I received a communication from the District Forest Officer, South Salem, stating that honey and wax will not be sold in future by the Department in that portion of the Shevaroys—which is included in the South Salem Division, that the leases expired on 30th June last, and that under the Forest Act, it is penal to collect honey and wax in reserved as well as unreserved land without permit. Up to the present I have not heard from the D. F. O., North Salem.

With reference to the change of Postal Service to Nagalur P. O. (*via*) Bommodi, the scheme does not appear to commend itself to Government. The correspondence relating to the subject was discussed at a meeting of the residents and planters, Nagalur District, at Arcadia Bungalow and a decision to drop the matter for the present was arrived at.

It is gratifying to note that this Association has again a seat on the District Board, and is represented by Revd. Father Capelle. I have every confidence in saying that the interests of the Community will be well looked after by him.

I feel it my sad duty to allude to the great loss we have sustained by the death of two of our members (viz.) the late Mr. Robert Gompertz and the late Mr. F. D. Short. They were connected with this Association from its infancy and both took active parts in its administration. The late Mr. Gompertz also took a leading part in Planting Politics at Bangalore some few years ago and great regret was expressed when he retired. Fitting

resolutions referring to the deceased gentlemen were unanimously carried at the meeting held immediately after their deaths and their families were duly acquainted with the sentiments expressed.

In conclusion, gentlemen, the committee and myself place our resignation in your hands. I take this opportunity of thanking the Committee for the assistance and advice they always rendered me during the year. I trust you will see your way of electing an Honorary Secretary from the ranks of the younger members—who I am sure would carry on our Planting Politics with greater energy and be able to devote more time to your interests than I have been able to do.

(Signed) CHARLES DICKINS,
Honorary Secretary, S. P. A.

Proposed by Mr. Turner and seconded by Mr. K. Leeming and carried that the Honorary Secretary be thanked for his report and that the same be adopted and printed.

(3) ASSOCIATION ACCOUNTS,—The Accounts showing a balance of Rs.391-14-2 to the credit of the Association at end of August, 1915 were pronounced correct by the Auditors (Messrs. C. Rahm and G. Turner).

(4) (*a*) THE PLANTERS' WAR FUND.—Read letter dated 28th August, 1915 from the Secretary, U. P. A. S. I. A subscription list was circulated at the meeting and the following "donations" promised:

Mr. G. Turner (subscribed at U. P. A. S. I. meeting Rs. 20 per mensem till end of War).

Messrs. S. M. Hight Rs. 150, C. Dickins Rs. 50, C. Rahm Rs. 50, K. Leeming Rs.50, W. I. Lechler Rs.50, J. C. Large Rs.50, C. G. Lechler Rs.30. Total donation Rs.430.

The Honorary Secretary was requested to send the subscription list WITH AN URGENT APPEAL FOR SUPPORT to all members of the Association who did not attend the meeting and also to planting Non-Members, drawing their attention to Mr. Murphy's eloquent speech made at the U. P. A. S. I. Meeting.

(*b*.) AEROPLANE PROPOSAL.—Read letter dated 28th August 1915 from Secretay, U. P. A. S. I. It was decided that those members who were desirous of supporting this Fund should send their cheques direct to Secretary, U. P. A. S. I.

(*c*.) U.P.A.S.I. GUARANTEE FUND TO SCIENTIFIC DEPARTMENT:—Read letter dated 31st August, 1915 from Secretary, U. P. A. S. I. As no member at this meeting was willing to come forward as a guarantor, the Hon. Secretary stated that he would bring the matter up again at the next General Meeting which he hope would be better attended.

(*d*) S. I. P. B. FUND.—Read letter dated 28th August, 1915 from Secretary, U. P. A. S. I. A hope was expressed that those members who supported this Fund would endeavour to try and get their friends to do so.

(5) ELECTION OF OFFICE BEARERS FOR YEAR 1915-1916.—Mr. C. Dickins was elected Honorary Secretary and Revd. Father Capelle, Messrs. S. M. Hight, K. Leeming, J. C. Large, E. L. Poyser, C. Rahm, G. Turner, Committee Members.

The Meeting terminated with a vote of thanks to the Honorary Secretary for his past year's services to the Association.

(Sd.) CHAS. DICKINS.
Hon. Secretary. S. P. A.

LABOUR DEPARTMENT.

With reference to the defaulters mentioned in Circular No. 5 of 1914 these men have now been sentenced to one year's rigorous imprisonment under Sections 465 and 471 of the I. P. C. (fraudulent or dishonest use as genuine of documents with a knowledge that they were forged, and of attempt to cheat.) These men tried it on with Mr. Fowke, of Attiegonda Estate, North Mysore, and with Mr. Raikes, of Giri, Bababudins, who got Warrants for them but the Police could not catch them. Information was afterwards obtained that they were operating in the Kanan Devan District which they drew blank and went to the Anamalais, where owing to the promptitude and resource of Mr. Hatton Robinson, of Valparai Estate, they were run to earth. The thanks of the whole planting community are due to Mr. Robinson who took great trouble at personal inconvenience for the public good, and also to Mr. Raikes who originally made the long journey from the Bababudins to Palghat in the most public-spirited way, and subsequently sent his Writer to the Coimbatore district at great inconvenience.

After a hunt lasting 9 months it is disappointing that only one year's rigorous imprisonment was inflicted, especially as these criminals have already done time for similar offences before, and commenced the same trick almost immediately after coming out of jail, showing clearly that the previous punishments were in no way deterrent. Almost the whole brunt of the work necessary to being the rascals to book fell upon the Labour Department and its subscribers, Mr. Day, the Deputy Director, especially having worked hard in the matter. One cannot help wondering how things would have gone, had they been left in the usual channels to run their own course.

AYLMER Ff. MARTIN,
Director.

Bangalore, 4th October, 1915.

CEYLON.

RUBBER EXPORTS IN MAY.

The following statistics of the exports of rubber of domestic production from Ceylon during the month of May, and five months ended May, 1914 and 1915, have been extracted from official returns issued by the Ceylon Government :—

To	May. 1914. lbs.	May. 1915. lbs.	Jan.-May. 1914. lbs.	Jan.-May. 1915. lbs.
United Kingdom ...	815,676	1,507,145	6,568,047	13,344,926
United States ...	775,575	849,794	3,319,816	5,084,644
Other countries ...	243,955	213,152	2,829,529	1,219,785
Total exports of rubber of domestic production ...	1,835,206	2,570,091	12,717,392	19,649,355

—*The Board of Trade Journal.*

CORRESPONDENCE.

1st October, 1915.

THE EDITOR,

The Planters' Chronicle,

Bangalore.

Dear Sir,—Your letter from *Vive et Vivas.*

There seems a charm in Planting in Peermade which should counterbalance higher advances elsewhere. Protection for the Planter. Your correspondent writes of getting a maistry *punished* for bringing 60 coolies instead of the 100 contracted for.

In a long experience I've *never heard* of such a thing.

In Mysore if you wish to prosecute a cooly, say for Rs. 25 you may have to attend court 6 or 8 times and then lose your case: you surely will if you fail to attend personally.

If you prosecute a Kangany for say Rs. 500 you should go for him for cheating-as you've found out he has no coolies and no property and not working for some one else, when you found him. But you will find, in Mysore, a Kangany *can't* cheat. If you try Breach of Contract—it is up to him and his vakil to plead dozens of *excuses*, which each and all have more attention than the Breach of Contract in Mysore.

If the Labour Department could get a Form of Agreement *recognised by the Mysore Government*—a Breach of which in any way would be considered either as cheating or as coming under Act XIII, they would do an *immense* good. I know one does meet individual planters who claim to have had this greatest satisfaction—against such I will bring very many who say nothing will induce them to go to Court.

It is not so very many years ago North Mysore was *ready to show* what a *trifle* they lost per acre in advances, and so a new Act was unnecessary, and now!

The maistry and the cooly have learnt the value of the Law and the planters in Mysore has no use for it—not perhaps that there are fewer cases in Court, because native competition and vakils have multiplied them.

Planters down south have little idea what a thin time a Mysore Planter has in Court, and the Labour Department *could* show it.

I am, dear Sir,

Yours faithfully,

OLD MYSORE.

SHIPPING IN AUGUST.

The tonnage of vessels entered at ports in the United Kingdom from foreign countries and British possessions *with cargoes* during August, 1915, amounted to 3,041,545 tons, and the tonnage cleared to 3,222,239 tons, as against 3,221,495 tons entered, and 2,462,964 tons cleared, during August, 1914. With regard to the coasting trade, the tonnage arrived *with cargoes* during August, 1915, amounted to 2,365,900 tons, and the tonnage departed to 2,341,929 tons, as against 2,663,501 tons arrived, and 2,588,570 tons departed, in August, 1914.—*Board of Trade Journal.*

SCIENTIFIC DEPARTMENT, U P. A. S. I.

Scale of Fees for analysis in the Bangalore Laboratory.

A.—SOILS.

		Rs.
1.	Complete Chemical Analysis, including the available Potash and Phosphoric Acid	...40
2.	Mechanical Analysis	...10
3.	Complete Chemical and Mechanical Analysis ...	...50
4.	Calcium carbonate and oxide content	...10

B.—FERTILISERS.

1.	Potash in Potassic Fertilisers	8
2.	Phosphoric acid, total and citrate soluble, in Phosphatic Fertilisers	8
3.	Organic Matter, Insoluble Matter, and Nitrogen in Poonacs, &c.	6
4.	Organic Matter, Insoluble Matter, Nitrogen, and Phosphoric acid in Bones, Fish, &c.	8
5.	Complete Analysis of Fertilisers such as Composts, Cattle manures, &c.	...20
6.	Complete Analysis of Lime, Limestones, and Slaked Lime	...10

Half the above rates will be charged to all Members of District Planters' Associations.

For methods of taking samples of Soils and Fertilisers and the quantities to send for analysis see *Planters' Chronicle* Volume X pages 207 and 216.

All samples for analysis should be sent plainly labelled to "The Planting Expert, 25, South Parade, Bangalore," and should be accompanied by a covering letter giving full information about the sample and the analysis desired according to the above table. Fees should be remitted to "The Secretary of the United Planters' Association of South India, 25, South Parade, Bangalore."

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 42.] OCTOBER 16, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert publishes an article on "Why it does not pay to buy low grade fertilisers." Examples are given and the whole is summed up in the last para "that when the cost of transport to the Estate is high it does not pay to substitute low grade for high grade fertilisers."

He also gives us an article on Rubber in Brazil compiled from the the Diplomatic and Consular Report for the year 1912-1913. The anticipated production of plantation rubber for the next few years is given.

The Scientific Officer, in accordance with arrangements made at the last Annual General Meeting, proceeds on tour from to-morrow the 17th instant in South Mysore and will be absent from headquarters until the end of this month for certain.

The Proceedings of the Nilgiri and West Coast Planters' Association are published.

The Director of the Labour Department issues a notice as to the change of Mr. Clementson's headquarters from Villupuram to Chingleput.

The Director of the Labour Department it will be remembered is on tour until 28th instant.

Vive et Vivas sends us a further letter on the subject of advances. He also apologises for trespassing on our columns. No apology is necessary and we wish others would break the good resolutions they have made to preserve "a cheerful silence" on all matters of interest to the planting industries of Southern India.

We publish a letter from Mr. Hodgson, at one time Chairman of the U. P. A. and Planting Member of Council. Many who knew him will be glad te hear of his welfare and that Government are utilising the talents first nurtured in the S. P. M. R. which he eventually commanded.

Also Mr. Guy Owen, the Representative of the U. P. A. on the London Chamber of Commerce, writes that he is serving as a Major in the A. S. C. The best wishes of the planting community attend them both.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Why it does not pay to buy low grade fertilisers.

In a lecture delivered at the Annual Meeting of the U. P. A. S. I. an example was given to show that *when the cost of transport to the estate is high it does not pay to substitue low grade for high grade fertilisers.*

Recently in the course of correspondence a case was submitted to me which forms such an excellent example of the same proposition that with the kind permission of my correspondent it is here stated for the benefit of planters in general.

In the issue of the *Chronicle* for 17th July (*X. 29*) an analysis of Coconut Poonac was given and it was stated that the price of this Poonac was then Rs.12-14-0 per ton. This being so the question arose whether at this low price it would not be profitable to substitute it for high grade poonac like Groundnut in mixtures applied to Tea and other crops.

In the particular case submitted to me the usual mixture used was one of :—

310 lbs. Ground Nut Poonac.
50 lbs. Blood Meal.
90 lbs Steamed Bone Meal.
50 lbs. Sulphate of Potash.

This has the following composition in plant food :—

	Nitrogen.	Phosphoric acid.	Potash.	Nitrogen.	Phosphoric acid.	Potash.
	%	%	%	lbs.	lbs.	lbs.
310 lbs. Ground Nut Poonac ...	8	1·4	1·2	24·8	4·34	3·72
50 lbs. Blood Meal ...	12	—	—	6·0	—	—
90 lbs. Steamed Bone Meal ...	3·5	25	—	3·15	22 5	—
50 lbs. Sulphate of Potash ...	—	—	50	—	—	25
500 lbs. of mixture ...				33·95	26·84	28·72

Now if Coconut poonac is substituted for Groundnut, to make a mixture of the same composition as the above as nearly as possible we shall have to use the following proportions :—

	Nitrogen.	Phosphoric acid.	Potash.	Nitrogen	Phosphoric acid.	Potash.
	%	%	%	lbs.	lbs.	lbs.
700 lbs. Coconut Poonac ..	3·5	1·47	1·89	24·5	10·29	13·23
60 lbs. Blood Meal ...	12	—	—	7·2	—	—
65 lbs. Steamed Bone Meal ...	3·5	25	—	2·27	16·25	—
30 lbs. Sulphate of Potash ...	—	—	50	—	—	15
500 lbs. of mixture ...				33·97	26·54	28·23

Now let us consider the cost of these alternative mixtures on the estate. The prices quoted below are those actually charged by the Firm of Manure suppliers except in the case of Sulphate of Potash. It is impossible to get anyone to quote a price for this but it has been put at Rs.200 per ton as about a fair figure. The cost of transport from the supplier to the estate was in this particular case Rs.18-6-0 per ton. Now we have in the one case :—

	Rs.	A.	P.
310 lbs. Ground Nut Poonac at Rs.80 per ton ...	11	1	2
50 lbs. Blood Meal at Rs.195 per ton ...	4	5	8
90 lbs. Steamed Bone Meal at Rs.80 per ton ...	3	3	5
50 lbs. Sulphate Potash at Rs.200 per ton ...	4	7	5
Transport on 500 lbs. at Rs.18-6-0 per ton ...	4	1	8
Cost on estate of 500 lbs. of the mixture ...	Rs.27	3	4

In the other case we have as the equivalent of this 855 lbs. of the second mixture,

	Rs.	A.	P.
700 lbs. Coconut Poonac at Rs.1-4-0 per cwt. ...	11	11	6
60 lbs. Blood Meal at Rs.195 per ton ...	5	3	7
65 lbs. Steamed Bone Meal at Rs.80 per ton ...	2	5	2
30 lbs. Sulphate Potash at Rs.200 per ton ...	2	10	10
Transport of 855 lbs. at Rs,18-6-0 per ton ...	7	0	3
Cost on estate of 855 lbs. of the Mixture ...	Rs.28	15	4

It will thus be seen that the second mixture is the more expensive of the two. Since this question was first submitted to me the price of Coconut Poonac has gone up to Rs.2-8-0 per cwt and this would make the cost of the second mixture Rs.40-10-10 and exaggerate the difference in price.

Thus my original proposition stands proven, that *when the cost of transport to the estate is high it does not pay to substitute low grade for high grade fertilisers.*

RUBBER PAVING.

Under the sanction of the City authorities, says *the Journal of the Royal Society of Arts*, the pavement in front of the offices of the Malay States Information Agency at 88, Canon Street, has been relaid with rubber tiles, the work being carried out to the order of the Agency by the Leyland and Birmingham Rubber Co., Ltd. These tiles are twelve inches square and half an inch thick, laid on a cement concrete bed, and when walked over give none of the jarring effect experienced from stone pavement. These tiles are manufactured from plantation rubber, and it is hoped one result of the experiment will be to popularise this form of paving, if not for the roadway at least for the foot pavements of our cities.

RUDOLPH D. ANSTEAD,
Planting Expert.

AGRICULTURAL STATISTICS.

Rubber in Brazil.

The following account of the Rubber Industry in Brazil has been compiled from the *Diplomatic and Consular Report* for the years 1912-13.

Brazilian rubber exports in 1912 amounted to 42,286,089 kilos. as compared with 36,547,135 kilos. in the previous year. In 1913 there was a large decline not only in prices but also in the amount exported which was 35,861,095 kilos. These exports were distributed as follows: —

To	1911. Kilos.	1912. Kilos.
United States	16,145,999	21.321.590
United Kingdom ...	15,661,862	14,728,257
France	3,221,440	4,456,374
Germany	1,058,087	1,660,235
Uraguay	277,410	10,641
Other countries	182.337	128,992

The competition of the eastern rubber plantations led the Government to adopt a number of measures in the hope of staving off the threatened crisis. These measures included the free entry of all materials required for the industry, premiums on systematic plantations, the establishment of experiment stations, railway construction, and the holding of a rubber exhibition at Rio de Janeiro every three years. Mainly, however, through lack of funds the Brazilian Government has as yet done little towards the carrying out of these reforms, which not only require a heavy expenditure, but are of too elaborate a nature to bring the immediate relief to the industry so urgently needed, and at the end of 1913 all hope of carrying out the reforms was abandoned and in the budget for 1914 only £85,000 was voted for the purpose. Out of this sum £40,000 was to go to a Brazilian for a secret process he is said to have invented for treating rubber.

At the beginning of 1912 a commission was sent out by the Government of Para to study the methods of rubber cultivation in Ceylon and the Malay Peninsular. The commission came to ths conclusion that unless immediate measures were taken, Brazilian rubber would even in 1915 begin to feel critically the effects of eastern competition. Later in the year two French exports were commissioned by the Federal Government to report on the conditions of rubber production in the Northern States and upon the most suitable methods for carrying into effect the Government's projected reforms. It cannot be said, however, that Brazil is now in a better position than she was two years ago for fighting the growing competition of eastern rubber. In all the factors which combine to make up the cost of production Brazil stands, at a great disadvantage to her eastern rival. The labour in the Amazon States is of negro, or half-caste, origin, and skilled labour is scarce and expensive. The labourer cannot buy his daily food for less than 2*s*. as compared with the few pence required by the eastern cooly for his curry and rice. While in the mid-east the daily wage is less than 1*s*. in the Amazon districts the average wage is 6*s*. 8*d*. and, including rations, is equivalent to 8*s* 8*d*. per diem. The rubber properties in Brazil are mostly situated at Great distances from the port of shipment which adds considerably to the cost of the product.

The anticipated production of plantation rubber in the next few years has been estimated at the following amounts :—

				Tons.
1914	...	...	...	75,000
1915	...	...	...	115,000
1916	...	...	...	155,000
1917	...	...	...	200,000

In 1914 the increase in the supply of plantation rubber entailed the exclusion of at least 10,000 tons of the poorer wild rubber from the markets and unless Brazil takes immediate steps for protecting the industry the present production will, in all probability, be reduced by one half in 1916-17.

An immediate solution, but one most difficult to carry out, would be the reduction, or better still, the abolition of the heavy export duty. Unfortunately the revenue of the Northern States is derived almost exclusively from these duties and as all other forms of cultivation have been neglected there are no other takable sources from which to replenish the revenues.

The abolition of the heavy export duties is alone sufficient to put Brazilian rubber on competing terms with plantation rubber. All attempts to reorganise the industry and cheapen the cost of production have so far failed. The Northern States are impotent to help themselves and unless the Federal Government come to their assistance there seems little hope for the future of Brazilian rubber.

R. D. A.

Advantages and Defects of Plantation Rubber.

Mr. W. A. Williams has a paper on this subject in the *Rubber Industry* of which the following is a summary published by the *Journal of the Society of Chemical Industry.*

Medium grades of rubber, such as Africans, have been largely displaced by plantation rubber, because it gives less trouble in manufacture and better products. Where low resin content is a desideratum, as in certain work to specification, plantation rubber can be used where medium grades could not. Comparison with fine hard Pará shows that the plantation product is inferior in uniformity and, generally speaking, in strength. In the author's opinion, if a more uniform product could be supplied in a damp condition than dry, the presence of moisture would not constitute a serious disadvantage. As examples of the variation which occurs in curing capacity, instances are quoted in which the time of cure had to be increased by 16·6, 40 and 100% respectively. Stress and strain tests do not give a sufficient indication of the value of plantation rubber as compared with Pará, for although in this respect the two rubbers may be equal, the plantation product fails under fatigue, as when used for catapult cord.

Comparing the different forms in which plantation rubber is marketed, the author has found the best all-round manufacturing results to be given by unsmoked sheet. Creping should be left entirely to the factory. Plantations should turn out the strongest possible product. Smoked sheet shows no advantage in working over unsmoked, and has the drawbacks of a higher loss on washing and higher resin content.

The effect of adding sodium bisulphite to the rubber mixture has been studied : 0·125% increases the time of cure 18% ; 0·25% increases it 27% and reduces breaking stress 20% and strain 15% ; 3% entirely prevents complete vulcanisation. In view of the marked effect upon cure of the presence of small quantities of certain impurities, chemicals should not be added to the latex or rubber without the most careful consideration.

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

At a General Meeting of the Nilgiri Planters' Association held at the Collector's Office on Monday, the 27th September, 1915,

PRESENT.—Messrs. J. S Nicolls, Chairman, L. A. Gerrard Rogers, Honorary Secretary, Robert Stanes, James Stanes, Norman Gray, B. A. Marden, Sydenham Clarke, R. Grove, W. A. Cherry, W. Moir, W. Deane, and Leslie Rogers. *Visitors*—Messrs. Herklots, M. Young, I.C.S., and R. D. Anstead, Planting Expert, U. P. A. S. I.

SIR HAROLD STUART'S VISIT TO THE WYNAAD.—Mr. Nicolls in a few words, before the business on the agenda was taken up, told members present that the Hon'ble Sir Harold Stuart had visited the Wynaad to inspect that part of the country through which the proposed Wynaad—Shoranur Railway might pass. Mr. Nicolls said that no doubt members would have read the Hon'ble Member's speech in the newspapers. Sir Harold Stuart was taking great interest in the proposed line and had not spared himself on his tour of inspection.

Mr. Nicolls' speech was received with much enthusiasm and a unanimous vote of thanks to Sir Harold Stuart, proposed by Mr. Nicolls and seconded by Mr. Robert Stanes, was carried.

No. 151. PROCEEDINGS OF LAST MEETING were taken as read.

No. 152. DELEGATES' REPORT.—The following Delegates' report was then read and a vote of thanks proposed by Mr. Sydenham Clarke and seconded by Mr. Grove was unanimously carried.

"Gentlemen,—According to your instructions we attended the 22nd Annual General Meeting of the U. P. A. S. I., held at the Mayo Hall, Bangalore, on the 16th, 17th, 18th and 19th of August, 1915. There were 12 Associations represented by 20 Delegates, South Travancore regretting that they were unable to send a Delegate. Amongst the 34 Visitors that attended the Meeting we had the pleasure of welcoming Sir Hugh Daly, K.C.I.E., C.S.I., Sir M. Visweswaraya, K.C.S.I., C.I.E., M.I.C.E., Mr. D. T. Chadwick, I.C.S., Mr. Hannyington, I.C.S., Mr. A. R. Cox, I.C.S., Dr. Coleman, Mr. Harrison and Mr. A. K. Menon and Members of Mercantile Firms. Full reports of the proceedings in open Meeting have appeared in the press and there is little left for us to report to you. But we strongly advise every member procuring for himself a copy of the Book of Proceedings as much of the discussions in committee will be found to be more than that of passing interest.

There were 27 resolutions carried which convey to you an idea of the amount of work that occupied the meeting for 4 days.

Railway Communication, Harbour Development and Scientific Department are of particular interest to all of you.

RAILWAY.—The Delegate from the Wynaad brought up the matter of the proposed Wynaad-Shoranur Railway and you will have no doubt noted that the resolution carried was on the lines of the resolution passed at our last General Meeting held on the 1st July, 1915. We seconded the resolution. Since the U. P. A. S. I. Meeting matters have progressed and Sir

Harold Stuart accompanied by the Hon'ble Mr. Murray and the Hon'ble Mr. Barber have already gone over the country which the proposed Railway may pass through.

HARBOUR DEVELOPMENT.—To you who have read the paper report of the late Meppadi Meeting, Sir Harold Stuart's statement as regards the Cochin Harbour must be welcome information.

SCIENTIFIC DEPARTMENT.—Mr. Chadwick, I. C. S., told us the proposed scheme was now before the Government and the Committee had the assurance of the Hon'ble Mr. Cardew that it would receive the most careful attention. It would not be possible to appoint a mycologist till after the war. A resolution was passed that the present Scientific Department Committee continue as executive and in conjunction with Honorary Secretaries of District Associations arrange sites of proposed experimental stations and other details of the reorganisation of the Department. A guaranteed list of donations was started at the meeting and was well supported by members present. This list with the appeal is being issued to all members of Associations through their Honorary Secretaries and we hope it will be supported by all proprietors.

LABOUR.—To all subscribers to this Department, the Directors report of the first year's working of the department will be of the greatest interest, showing that the department has already in its first year's working gone a long way to carry out what it had set itself down to do. The discussion on Mr. Murphy's resolution must have gone a long way to clear the air, and we feel certain that every one will recognize that the Labour Department wishes to make no enemies. The statistics given by the Director as regards Defaulters is striking. 412 defaulters were induced to return to the estates of subscribers to work off their indebtedness amounting to Rs. 32,392-10-10, This represents 17 per cent. on the amount subscribed to the Labour Department. We would lay stress on the word "induced." How much better it sounds than "Jailed."

MR. ANSTEAD'S TOURS.—We arranged for his visit to your District and he is now amongst you.

PLANTERS' BENEVOLENT FUND.—We spoke on this subject regarding Mr. Brown's fears expressed at your last General Meeting as to the fate of those members of the Anglo-Indian Community who have been subscribing to the Fund, and we were assured that everyone who was a member of the Fund now, would in no way be adversely treated. A strong appeal was mad by the Chairman for further subscriptions to the Fund, and we feel certain that non-subscribers after reading his speech will support the Fund with an open hand.

EUROPEAN ASSOCIATION.—We carried our resolution and hope that every eligible person will strengthen the hands of the Association by becoming a member.

RAILWAY FREIGHT ON TEA SEED.—Mr. Dandison clearly stated our views in an able speech and the resolution was carried.

FREIGHT.—This matter was forcibly put before the Meeting by the Kanan Devan Delegate and we supported the resolution.

WAR FUND.—Mr. Murphy in a most eloquent and stirring speech gave reasons for "starting this Fund." A large amount, Rs.11,280, was voted in the room. Mr. Murphy convinced those present of the necessity of the Fund as no one else could have done. The amount subscribed then

must have given him satisfaction, and we feel certain after planters have read his appeal the support given to the fund will not only for ever remain a monument to his eloquence but to a good heart in the right place.

The election of Mr. C. H. Browne as Chairman will, we feel certain, insure the continuance of the usefulness of the U. P. A. S. I.

Thanking you for the honour you did us of electing us as your delegates.

We remain,

Yours truly,

A. F. DANDISON,

J. S. NICOLLS."

Mr. Anstead then addressed the meeting, and afterwards discussed some important matters with members present.

No. 153. U. P. A. S. I. CIRCULARS.—These were recorded. The Honorary Secretary was requested to send copies to all members.

No. 154. POLICING COFFEE.—With reference to a letter from the Superintendent of Police proposing to make the usual police arrangements from the 15th of November, the meeting passed a resolution asking that the date may be altered to 1st October.

No. 155. COUNTER ATTRACTIONS TO INTOXICATING LIQUORS.—With reference to the order of Government in this connection and a letter from the Collector on the subject. as well as a lettter from Mr. Robert Stanes, the meeting resolved that a sub-committee comprising Mr. Robert Stanes, Mr. Sydenham Clark, Mr. Leslie-Rogers and the Honorary Secretary meet the Collector and discuss with him as to the best means for the establishing of the tea and coffee shops referred to in the order of Government.

No. 156. ELECTION OF NEW MEMBERS.—Mr. Nicolls intimated that Messrs. Leslie-Rogers and W. Moir had desired to become members of the Association. They were duly elected.

VOTE OF THANKS.—A vote of thanks to Mr. D. T. Chadwick, I.C.S., Director of Agriculture, for having kindly permitted Mr. McRae to come up and investigate leaf disease on tea and to the Collector for the use of the room was proposed by Mr. Cherry, and seconded by Mr. Robert Stanes, carried unanimously.

(Signed) J. S. NICOLLS,

Chairman.

(,,) L. A. GERRARD ROGERS,

Honorary Secretary.

At the Meeting of the Sub-Committee held at the Collector's office on 27th September, it was decided that the Association were in favour of Government encouraging the opening of Tea and Coffee shops as much as possible along Ghat roads, near toll bars, bandy stands and wherever suitable, as long as it does not encourage petty thefts.

(Signed) L. A. GERRARD ROGERS,

Honorary Secretary.

West Coast Planters' Association

Proceedings of a General Meeting held at Malabar Club, Calicut, on the 9th October, 1915.

PRESENT.—Malayalam Rubber and Tea Co. per Mr. A. C. Morrell (Chairman), Mooply Valley Rubber Co. per Messrs. A. H. Mead, E. H. Halliley, J. Owen, Edivanna Rubber and Tea Co. per Mr. R. Lescher, Kerala Rubber Co. per Mr. A. H. Robb, Pudukad Rubber Co. per Mr. A. H. Mead, and Mr. W. O. Wright, Pullangode Rubber Co. per Mr. H. Waddington (Honorary Secretary). *Visitors*:—Messrs. N. B. Hartley, Parker, H. Hadow and G. H. Hodson.

The Proceedings of the last meeting were confirmed.

235. U. P. A. S. I. CONFERENCE.—The Honorary Secretary read report of the Delegates and a vote of thanks was carried unanimously. The Honorary Secretary was asked to have report printed and copies circulated to members with proceedings of this meeting.

236. RUBBER GROWERS' ASSOCIATION.—The Honorary Secretary explained present situation and steps taken to open a Branch in Southern India. Proposed by Mr. Mead and seconded by Mr. Lescher "That in view of Anamalai and Shevaroy Planters' Associations requiring representatives on proposed Committee it is desirable that the West Coast, Mundakayam and South Travancore Planters' Associations who are seriously connected with rubber, should be allowed to appoint two representatives each."—*Carried nem con.*

Mr. Mead was elected as first representative and in the event of two being allowed Mr. Morrel has been chosen to join him and act on behalf of this Association.

237. REGISTRATION OF CARTS.—Read correspondence from Mundakayam Planters' Association. Resolved that this Association support the Mundakayam proposals as regards registration of carts and the Honorary Secretary was instructed to address the Collector of Malabar, the Dewan of Cochin and the Chief Secretary to the Government of Travancore on the matter and suggest a fee be charged for registration.

238. SCIENTIFIC DEPARTMENT, U. P. A.—Mr. Anstead will visit Malabar this month. Mr. Lescher and the Honorary Secretary will be glad to put up any planter who wishes to meet him. Unanimously resolved that the Honorary Secretary be instructed to write the Director of Agriculture and convey the thanks of the Association to the Department for the great assistance they have given us in lending the services of their Mycologist, Assistant Mycologist and artist.

239. SCIENTIFIC DEPARTMENT GUARANTEE FUND.—Members were asked to put the matter before proprietors of estates and obtain their support.

240. S. I. P. BENEVOLENT FUND. Three members present promised subscriptions to this.

241. S. I. PLANTERS' WAR FUND & OVERSEAS AEROPLANE SCHEME. —Papers laid on the table.

242. LABOUR AND RATES OF PAY.—The Honorary Secretary explained the representations he had received from Mr. Hunt on this matter. Members present were of opinion the matter was one for individual decision.

With a vote of thanks to Malabar Club for loan of the room and to the Chairman the Proceedings terminated.

(Signed) A. C. MORRELL, *Chairman.*

(„) H. WADDINGTON, *Hony. Secretary.*

LABOUR DEPARTMENT.

Bangalore,
9th October, 1915.

Subscribers to the Labour Department are requested to note that Mr. Clementson's Headquarters have been changed from Villupuram to Chingleput. His telegraphic address is "Upasi," Chingleput.

AYLMER Ff. MARTIN,
Director.
U. P. A. S. I. Labour Department.

CORRESPONDENCE.

Peermade. 6th October, 1915.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—I am sorry Mr. Martin has forced me to break my good resolution not to trespass again on your columns, but his letter calls for an answer. It is not my anonymity that worries Mr. Martin but the fact of my "letting the cat out of the bag" that has raised his ire. I shall be delighted to send him my thumb impression and I am sure he will find the duplicate in his archives.

I am not so young as I once was so I find that a little "scotch" bucks me up a bit, but if barley water is the elixir of perennial youth as it seems to be, I shall be glad to give that seemingly insipid concoction a trial.

That Peermade had original Tinnevelly labour connections there is no doubt, and the remains of them are there to-day. My information was first hand from one of the pioneers of this District so there was no hearsay about my statements.

Does Mr. Martin really believe that the 19,000 coolies in the High Range to-day are the expansion of the very small connections he mentions in his letter? If so, can he explain how it is, leaving out of account over-advancing, that the Peermade connections have not expanded in the same ratio when, as Mr. Martin knows, had they had the money, the Peermade planters were quite as able to work up their labour connections as the Ceylon men were, who were imported to open the High Range, and who were very ignorant of Indian conditions for a time?

I do not need to contest my point further as Mr. Martin admits that Peermade did have Tinnevelly coolies before Messrs. Jas. Finlay & Co., Ltd., arrived in the High Range, and he also grudgingly admits that "the advantage may rest with the High Range where higher advances were undoubtedly paid." These are the two main points at issue, so that it is for him to see that we do not remain longer in our unfavourable position, and if he does so I am content.

In closing, Mr. Editor, allow me to say that if Mr. Martin is going to preach self-interest instead of unity, I am afraid he will have to add a good deal of "the best Irish" to his barley water before he sees his ideals carried out.

Yours faithfully,
"VIVE ET VIVAS."

19th September, 1915,
Arnprior,
Exmouth,
S. Devon.

War Fund.

Dear Sir,—In the *Madras Weekly Mail* of the 27th August, I see a "Planters' War Fund" has been started for the help of S. India planters, who have joined the army.

Being over 60 years of age myself I am considered unfit for this work, but I have much pleasure in forwarding a donation, which I enclose, to help my brother planters who have answered the call of our King and Country.

It may be of interest to some of my old friends to know that I am commanding the Deal Unit of the Volunteer Training Corps (which now number in England over 350,000) and that only yesterday my Corps was inspected by order of the War Office, with a view of making use of the organisation. It is possible that some will go to France to work at the base—and thus release troops for the fighting line.

I shall hope to receive in due course the printed proceedings of the last U. P. A. S. I. Meeting which you kindly send me and in which I continue to take great interest.

Yours faithfully,
(Signed) H. PERCIVAL HODGSON.

THE SECRETARY,
U. P. A. S. I.,
Bangalore.

COFFEE.

The market is rather firmer, and apart from any facilities which may be granted for export, good home trade descriptions will probably fetch higher prices in the near future. Supplies bought earlier in the year are getting low in many directions, and this, together with the present tempting prices, should lead to a stronger enquiry. It must also be borne in mind that although the stocks are heavy, the proportion of fine Costa Rica, East Indian and useful Colombians is small. A great deal of the present supplies is useless to the home trade, and fine parcels are becoming scarce.

LONDON COFFEE RETURNS.

	Home* Consumption.		Export.		Stock.	
	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.	1915. Tons.	1914. Tons.
For week ended September 4 ...	299	154	78	66	31,087	21,423
For 36 weeks ended Sept. 4 ...	14,053	10,800	18,026	18,526	—	—

*The Home amount contains a proportion for Export delivered by cart.

—*The Produce Markets' Review.*

SOUTH INDIAN PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	14,360	0	0
Mr. Campbell Hunt	30	0	0
Mr. Norman Mather	10	0	0
Mr. B. M. Behr	150	0	0
Mr. T. S. Gillatt	150	0	0
Mr. H. P. Hodgson	500	0	0
Mr. W. Morres	50	0	0
Mr. W. R. Wright	100	0	0
Mr. W. A. Asher	150	0	0
Mr. J. W. Irwin	250	0	0
Mr. P. Hunt (Monthly)	10	0	0
Mr. St. John Hunt (do)	10	0	0
Mr. A. R. Park (do)	20	0	0
Total Rs...	15,790	0	0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed	*2,197	8	0
Mr. Sam J. Wilson	10	0	0
Mr. H. W. Sheldrick	25	0	0
Total Rs...	2,232	8	0

*In the *Planters' Chronicle* of October 2nd, there was a Printers' mistake. Instead of Rs. 2,927-8-0 the total is Rs. 1,927-8-0. The difference of Rs. 1,000 is deducted in the total of this week.

Indian Tea.

This week's auction, which comprised 32.000 packages, was postponed until Wednesday, in consequence of the restrictions placed on the removal of Tea from bond. The market was somewhat depressed and prices were irregular. There was little competition at the beginning of the sale, but later the demand improved considerably, and most of the offerings found buyers at a slight decline. The few flavoury Darjeelings attracted some attention, but the finest Assams were distinctly lower. In Calcutta 20,000 packages were offered, and of these about 16,000 were sold. The better grades were steady, but common to medium sorts were lower.—*The Produce Markets' Review.*

Coffee.

There has been little change in the market, which remains dull, although merchants generally seem decided to hold their consignments for better prices, rather than make any further concessions. With regard to the future there are two factors which would affect the situation. The re-opening of the export trade would, on the one hand, undoubtedly strengthen the market considerably, bnt, on the other, an increase of duty would probably have a depressing effect. It is probable that the resumption of export trade, if allowed, would more than offset the effect of an increased duty, and prices would in that event be firmer. In any case it is well to bear in mind that the Costa Rica and East Indian crops were small, and fine parcels are likely to be dearer owing to scarcity, whatever the future of the lower grades.—*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 43.] OCTOBER 23, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Officer. who is on tour contributes an article on "Organic and Inorganic Manures."

We publish the proceedings of the South Mysore Planters' Association.

With deep regret we publish the following telegram received last night from the Director of the Labour Department:—

"Ward died at 11 P. M., 21st at Srivilliputtur of inflammation of the "lungs."

Peace be to his ashes. The Department has lost an able and conscientious Assistant.

A correspondent writing under the *non-de-plume* of "Referee" is requested to send his name, not for publication, but as a guarantee of *bona fides*.

Once again I have been asked to publish the fact that the subscribers are paying only Rs. 2 an acre to the Labour Department. Those who come in *after the first year pay "an entrance fee of Re. 1 over and above the Rs. 2 per acre for the first year of joining."*—Vide Book of Proceedings for 1914—the last para of page 22.

SOUTH INDIAN PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	15,790	0	0
Mr. C. Lake	150	0	0
Mr. H. G. Bonner	40	0	0
Mr. R. N. C. Grove	25	0	0
Mr. E. P. Playford	15	0	0
Mr. E. S. Clarke	50	0	0
Mr. G. L. Acworth £100	1,500	0	0
Total Rs...	17,570	0	0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed	2,232	8	0
Mr. James Morgan	50	0	0
Mr. G. L. Newbery	30	0	0
Mr. R. N. C. Grove	25	0	0
Mr. E. P. Playford	15	0	0
Total Rs...	2,352	8	0

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Organic and Inorganic Manures.

At the last Annual Meeting of the U. P. A. S. I. I was asked to state explicitly the differences between organic and inorganic manures.

By organic, in contradistinction to inorganic, is meant any manure which is derived from the products of plant or animal life. The commonest organic manures used on estates in Southern India are the following, Green dressings, Cattle Manure, Milled or Whole Fish, Fish Guano, Poonacs of various kinds, Blood Meal, and Bone Meal.

Such Manures are mainly nitrogenous, but some such as Bones and Guano, are phosphatic while Fish contains both Nitrogen and Phosphoric Acid. All are deficient in Potash except good Cattle Manure which is of the nature of a complete manure if well made and stored.

Organic manures like Cattle manure, Fish, Poonac, &c., supply, in addition to the actual plant food in them, a large amount of Humus to the soil and to that fact their value may be largely attributed. The action of humus on the soil is of several kinds. It has a beneficial effect on the mechanical condition of the soil, making stiff clay soils which bind in wet weather and cake in drought, open and porous, while on the other hand it makes light sandy soils which dry out to great depths in the dry weather retentive of water.

The chemistry of Humus is not fully understood. It is composed of a large number of compounds, chiefly nitrogenous, and these compounds are gradually broken down by chemical and biological actions to simple bodies which can be taken up by the roots of the plant.

The biological effect of Humus is probably the most important of all. It serves as a store of food for bacteria and these gradually break it down into plant food.

Inorganic manures, more strictly called Fertilisers, are products derived from the mineral kingdom and they contain, Nitrogen, Phosphoric Acid, or Potash, or various combinations of these plant foods in a concentrated form. In contrast to Organic manures they are usually very soluble in water and quickly available to the plant, and they contain no Humus.

When Organic manures are used a form of plant food is added to the soil which becomes gradually available as the material rots and is broken down under the influence of bacteria and other agencies, and at the same time Humus is added which produces a mechanical effect on the soil, and finally in the case of material like Cattle Manure a large number of bacteria are added to the soil.

In contradistinction to this when inorganic manures are used, a highly soluble material is added to the soil which rapidly dissolves in the soil water and often produces a chemical reaction with the soil water contents, all the plant food in it is at once available. No humus and no bacteria are added.

The effects of organic manures may persist for several years, the effects of inorganic are more rapidly exhausted, and their residual value is small.

At Rothamsted a number of experiments have been tried to contrast the effects produced by these two classes of manures and they may be summarised by saying that as a rule organic manures produce better results when applied by themselves than inorganic manures when applied by them-

selves, but that the best results of all are obtained by a judicious combination of the two, especially of organic nitrogen in combination with inorganic phosphoric acid and potash.

In this connection the benefits of green manures should be emphasised. A green dressing of a leguminous plant supplies organic nitrogen in the best form of all and if this is buried with an inorganic phosphate, such as Basic Slag or Basic Phosphate, and Sulphate of Potash, one of the best combinations of these two great classes of manures is obtained. In this connection probably Ephos Basic Phosphate which is now on the Indian market, and about which a good deal has been heard lately, is worth a careful trial to contrast not only results obtained but actual cost of production of such results with the use of more familiar Phosphates such as Basic Slag and Basic Superphosphates which have had an extended trial and are known to produce good results on South Indian soils.

RUDOLPH D. ANSTEAD,
Planting Expert.

TEA.

Indian Tea.—The supplies offered at auction consisted of 24,400 packages. The demand was good throughout, and common kinds were firm at the lower level recently established. The quality of several of the higher grade invoices was very attractive, and all good liquoring parcels fetched full prices. The few fine Darjeelings offered met with good competition. Dooars kinds and some Assams are dearer. In Calcutta 27,000 packages were offered, and rates for the commonest were a trifle easier. The weather has generally favoured production, but some damage has been caused by floods in the Cachar district.

Ceylon Tea.—The quantity brought forward at the auctions on Tuesday last was about on a par with last week, but the demand was more active, and the market was dearer. The lower grades of whole leaf were in strong request, and advanced about ¼*d.* per lb., while much less was obtainable under 10*d.* Broken Pekoes under 1*s.* however, were most affected and many parcels rose ¾*d.* per lb. At the public sales 31,638 packages were brought forward, of which about 450 were withdrawn.

China Tea.—There was a small public sale on Wednesday, when about 540 packages were offered ; the bidding was poor and as the selection was without interest, no business was done. Prices remain firm for medium kinds, but the demand has been small and the amount of business limited. Monings from 1*s.* 0½*d* to 1*s.* 4*d.* are attractive , and when they are pure and take the milk well, they offer inducements for stock purposes.

Java Tea.- On Thursday, 11,800 packages were offered. There was an improved demand and prices were generally dearer. The quantity was good, For next week, 12,000 packages are in print.

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914. lbs.	1915. lbs.	1914. lbs	1915. lbs.
For week ended September 4 ...	4,890,923	9,910,763	2,032,279	1,187,275
For 36 weeks ended September 4 ...	202,804,460	209,391,783	31,729,758	37,190,898

—*The Produce Markets' Review.*

DISTRICT PLANTERS' ASSOCIATIONS.

South Mysore Planters' Association.

Minutes of a Meeting of the S. M. P. A. held at Hanbalu T. B., on the 9th October, 1915.

PRESENT.—Messrs. M. J. Woodbridge (President), A. R. Park, F. M. Hamilton, C. J. Hayward, P. Hunt, St. J. Hunt, G. H. Gowans. D. Jackson, G. N. Frattini (Assistant Scientific Officer) and A. Thomson, Honorary Secretary.

The President in the Chair.

The Minutes of the last meeting were read and confirmed.

U. P. A. DELEGATE'S REPORT.—Mr. Hayward gave his report of the meeting. Proposed from the Chair a vote of thanks to Mr. Hayward.

INSTRUCTIONS TO DASSARA DELEGATE.—The Meeting regretted the absence of Mr. Rutherford and the Honorary Secretary was asked to instruct Mr. Rutherford in the following matters: Title Deeds, Roads and Subordinate Medical Officers. Also that the Excise rules should be strictly enforced in the Hassan and Kadur Districts and gambling put down at liquor shops.

PROPOSED LABOUR LAWS.—These were gone into and amended. Proposed by Mr. Hayward and seconded by Mr. P. Hunt that Mr. Hamilton be elected delegate to meet the delegates of the N. M. P. A. and B. P. A.—*Carried.*

SOUTH INDIA PLANTERS' WAR FUND.—The President spoke strongly supporting and recommending this Fund to the notice and consideration of members.

COUNCIL.—The recommendation of the Council was sanctioned on condition that Associations were no longer liable to provide a horse for cross country journeys.

ROADS AND COMMUNICATIONS.—Resolved that the attention of the Postal Authorities be drawn to the fact that since the last meeting of this Association no improvement has been noticed in the arrival of posts in Mudigere and Saklaspur though a communication was addressed to the Postmaster-General and his reply received on the 1st of August.

CORRESPONDENCE AND ASSOCIATION'S PAPERS.—Correspondence in connection with the Arsikere and Hanbalu roads with the Executive Engineer, Hassan District, was read and as no reply had been received the Honorary Secretary was instructed to forward a copy to the Chief Engineer.

MR. LAKE'S LETTER WAS READ.—As no notice was given the Honorary Secretary was instructed to put it on the agenda of the next meeting.

MR. ANSTEAD'S TOUR.—As far as possible owing to the short notice given, endeavours were made at the meeting to arrange a tour for Mr. Anstead.

The Meeting passed a vote of thanks to Mr. Park for a most excellent breakfast.

The Meeting closed with a vote of thanks to the Chair.

(Signed) A. THOMSON,
Honorary Secretary.

THE PREVENTION OF WASH.

At a Meeting of the Nilgiri Planters' Association held at Ootacamund on 27th September, the Planting Expert who was present made some remarks on this subject. Commenting on these the *Madras Times* made the following suggestions :—

"At a recent meeting of the Nilgiri Planters' Association Mr. Anstead, the Planting Expert, in his speech dealing with questions connected with his tour in that district, emphasised the necessity for guarding against the loss of soil by wash on steep slopes, and advocated as the most effective measures in this direction (1) the knifing of the weeds during the prevalence of heavy rain so that their roots would be left in the soil to bind it, and (2) contour working which would eventually tend to the terracing of the land. What is to be guarded against in this is the lower roots of the trees becoming exposed. Once before when writing on this subject I said I thought it was a good thing to build up the lower sides of the trees with stones, but I was thinking of moderately steep land. I have been assured since that in some cases coffee has been planted on land as steep almost as the face of a wall. In exceptionally steep land building up with stones would not answer at all. The inner side of the wall of stones would be filled with soil. This would induce the trees to grow roots into it; and the stones being always liable to be dislodged, these lower roots would be laid bare directly this occurred. I don't know how contour working would answer in very steep slopes. At first it would result in the rolling down hill of a good deal of soil; but, I suppose, this sacrifice would have to be put up with in order to get the terraces formed. On the steep slopes of ravines I have actually seen soiling literally pouring down. But it would seem that contour working on a very steep slope would result in a cutting being made some distance on the lower side of the trees, and this would be a perpendicular cutting of considerable depth in order to get a series of level platforms for the trees to stand upon. It would therefore—if the trees are 5 feet apart—appear an advisable precaution to not allow these cuttings to approach nearer than 3 feet to the stems of the trees. If they approached close up to them, the merest pull would bring the trees up by the roots. In the case of the steep slopes of ravines, the following procedure was followed in order to obtain the formation of a series of steps or terraces. Stout wooden keys were driven into the grounds across the contour of the slope. These were next plaited with sticks and twigs lying about in the coffee. The inside of these "palisades" were filled up with weeds tightly pressed down, and then the spaces between them were dug and the soil placed over the weeds,—care being taken not to carry the digging close up to the lower side of the keys which then might have come away. When the burned weeds rotted away and the level of the soil above them sunk, the next crop of weeds were piled above it and the soil from a shallow trench dug in the centre of each platform was covered over them. In process of time first the plaited sticks and twigs and thereafter the stout pegs rotted away; but in the meantime the soil on the inside of them, with the rain and the trampling of the coolies, had become consolidated and very tolerable contour terraces were formed which greatly facilitated the application of manures to these parts. Previous to this work being carried out on these steep slopes, they were regularly dug with forks from the bottoms of the ravines with rest of the estate, with result that any amount of soil would go rolling down with a rush at every digging. In the old days on the ghauts, wherever clean digging or clean mamoty weeding—the latter consisted of making a trench,

scaping all the weeds for a space of 5 ft. x 5 ft. above it into it, and then making a trench 5 ft. above the first and throwing the soil from it over the weeds in the former, and so on to the top of the estate—were carried out, it was not an uncommon sight wherever there was a stone, from the size of a pigeon's egg and larger, to see a column of soil of 3 or 4 inches in height formed under it, showing that the soil all round to that depth had been washed away. This was a more common sight where digging was carried out. As coffee on the ghauts was grown in the open, the growth of weeds was rampant, and this sort of work was done in order to got the weeds down quickly. Of course the land could not stand this loss of soil long and the coffee went out. But in one case where monthly hand weedings were carried out systematically till the whole ground became covered with moss, the coffee did not last much longer. In this case I suppose it was due to the soil becoming thoroughly consolidated and the consequent want of aeration that did harm. It is a pity that contour drains were not tried as in Ceylon. Where they were the complaint was that they readily became choked; but this was an argument in favour of keeping them clear, not against making them. In Ceylon aeration of the soil was secured by driving forks or crowbars into it, working them about and then withdrawing them. The drains also helped. Well, the soil has been so well preserved in the island, that tea successfully replaced coffee, and now Pará rubber is thriving on land that had previously been under both coffee and tea, and yet we are told that Ceylon soil bears no comparison with Indian coffee soils in richness."

PORTUGAL (ANGOLA).

Law respecting Export Duties on Uncleaned Coffee.

With reference to the notice at page 707 of the *Board of Trade Journal* for the 10th September respecting export duties on coffee exported from the Province of Angola, the "Diario do Governo" for the 8th September contains a Law (No. 398), dated the 8th September, which provides that uncleaned coffee exported through the Custom houses of the Province of Angola not included in the Conventional Basin of the Congo shall be subject to an export duty of 25 per cent. *ad valorem* as from the *1st February*, 1916, and that the export duty of 10 per cent. *ad valorem* on uncleaned coffee exported through Custom houses of the Province included in the Conventional Basin shall come into force on the same date.—*The Board of Trade Journal.*

Coffee.

The Brazil receipts for the past week amounted to 78,000 bags Rio and 208,000 bags Santos, against 20,000 bags and 101,000 bags respectively same period last year. The total to date now amounts to 4,017,000 bags, against 1,809,000 bags for 1914-15, 3,754,000 bags for 1913-14, and 2,823,000 bags for 1912-13. The Rio Exchange closes at 12¼*d.*

The London Terminal Market was firm on September 10th owing to "bear" covering of September delivery, and after fair sales at an advance of 6*d.* to 1*s.* 1½*d.*, the market closes quieter and below the best, including September at 37*s.* 3*d*, to 37*s.* 4½*d.*

Other sales include Costa Rica, small fair greenish to good colory, 58*s.* to 63*s.* 6*d.*; good middling colory, 75*s.*; bold fair greenish, 71*s.* 6*d*,; good greyish, 74*s.* 6*d.*; pea-berry, 83*s.* 6*d.* to 85*s.*

Colombian, low middling greyish, 56*s.* 6*d.*; bold fair mottled greenish, 59*s.*—*Tropical Life.*

RUBBER TRADE ASSOCIATION OF LONDON.

MONTHLY STATISTICS,

No. 5.

IMPORTS of all kinds of Rubber into the United Kingdom.

From	August. 1915.	August. 1914.*	August. 1913.*	Eight Months ended Aug. 1915.	Eight Months ended Aug. 1914.*	Eight Months ended Aug. 1913.*
Straits Settlements and Federated Malay States ...	3,081	2,356	2,062	29,034	19,265	15,533
Ceylon ...	863	680	657	9,180	4,856	3,765
British India ...	38	—	—	857	—	—
Dutch East Indies ...	280	—	—	1,822	—	—
Brazil and Peru ...	762	367	754	9,717	10,001	12,842
Africa ...	117	18	47	2,347	445	1,436
Other Countries ...	124	490	1,536	1,350	9,857	12,824
Total Tons ...	5,265	3,911	5,056	54,307	44,424	46,400

EXPORTS of all kinds of Rubber from the United Kingdom.

To	August 1915.	August 1914.*	August 1913.*	Eight Months ended Aug. 1915.	Eight Months ended Aug. 1914.*	Eight Months ended Aug. 1913.*
Russia ...	768	28	574	7,312	4,147	4,503
Germany ...	—	291	715	—	7,072	7,030
Belgium ...	—	109	174	—	1,460	1,308
France ...	509	209	391	4,514	4,341	3,191
United States ...	2,419	975	1,894	27,909	14.967	11,219
Other Countries ...	559	103	278	5,632	2.549	2,437
Total Tons...	4,255	1,715	4,026	45,367	34,536	29,688

* Including Waste and Reclaimed Rubber.

IMPORTS, DELIVERIES AND STOCKS in London and Liverpool, August, 1915.

		Imports. For Aug.	Deliveries. For Aug.	Stocks 31st August. 1915.	1914.	1913.
London	Plantation ...	4,066	3,680	5,131	3,524	3,138
	Other kinds ...	53	62	455	748	1,017
	Total Tons ...	4,119	3,742	5,586	4,272	4,155
Liverpool	Para ...	606	733	819	598	764
	Other kinds ...	178	139	490	874	1,134
	Total Tons ...	784	872	1,309	1,472	1,898
Total Tons for London & Liverpool ...		4,903	4,614	6,895	5,744	6,053

Shipments from Straits Settlements and F. M. S.

	July.			Seven Months ended July.		
	1915.	1914.	1913.	1915.	1914.	1913.
Tons ...	6,011	4,555	2,901	40,810	26,911	18,195

Shipments from Ceylon.

To	*July.	Seven Months ended July. 1915.	1914.	1913.	1912.
United Kingdom ...	648				
Russia ...	—				
Germany ...	—				
Belgium ...	—				
France ...	6				
U. S. A. ...	687	10,029	8,101	5,571	2,781
Other Countries ...	79				
Total Tons...	1,420				

* Figures made up to July 26th.

U. S. A. Imports and Exports.

	June.			Six Months ended June.		
Imports.	1915.	1914.	1913.	1915.	1914.	1913.
India rubber ...	8,387	4,209	3,981	46,887	33,946	26,740
Gutta and Balata ...	919	812	1,655	6,056	6,079	12,625
Total Tons...	9,306	5,021	5,636	52,943	40,025	39,365
Exports.						
India rubber ...	178	139	170	1,250	1,013	1,217
Gutta and Balata ...	26	7	—	282	47	38
Total Tons...	204	146	170	1,532	1,060	1,255

Para Receipts.

	August, 1915.	July, 1915.	Total.
Rubber ...	1,735	1,060	2,795
Caucho ...	510	230	740
	August, 1914.	July, 1914.	Total.
Rubber ...	1,348	1,040	2,388
Caucho ...	272	330	602

6, Mincing Lane.

10th September, 1915.

LABOUR MARKET.

The Labour Market in the United Kingdom since the Outbreak of Hostilities.

The August issue of the "Board of Trade Labour Gazette" contains a review of the position of the Labour Market in the United Kingdom in the year that has elapsed since the war began.

The first shock of war, it states, caused much uncertainty and some disorganisation of industry, and at the end of August, 1914, the Trade Union percentage of unemployed had risen from 2.8 to 7.1. These disquieting conditions were, however, of short duration, by the end of September a distinct improvement had been manifested, and by the end of November employment was at about the same level as that prevailing just before the war. Since November the demand for labour has steadily increased, and the industries engaged in supplying the requirements of the allied forces have for months past been working at the highest pressure.

Owing to the large number of enlistments the number of males available has greatly decreased. To meet this shortage of labour there has been a considerable transference from trades adversely affected by the war to other industries which were rendered abnormally active; in addition, there has been, wherever possible, a growing movement in the direction of substituting female for male labour. The net result is that at the present time there is very little unemployment, except in a few luxury trades, while in a number of industries, notably coal mining, engineering, shipbuilding, agriculture and transport, the demand for labour greatly exceeds the supply.

Partly owing to this great improvement in employment, and partly to the rise in the cost of living, nearly two and a half million work people have had since August 1914 increases in rates of wages or war bonuses, amounting to over £400,000 per week, or over 3s. per head of those benefiting. These figures are exclusive of increases which have been granted to agricultural labourers, seamen, railway servants, police and Government employees. They also exclude increased earnings owing to overtime.

Conditions in July, 1915.

With regard to the month of July this year, it may be said that the coal mining industry continued very busy and the shortage of labour was partly met by better time keeping. In South Wales, however, owing to a dispute, the industry was interrupted for few days. Employment in iron and lead mining was good and at shale mines very good; at tin mines and in the quarrying industry it was fair, except at quarries in North Wales, which continued to be affected by the lessened demand for slates.

The number of pig-iron furnaces is blast showed a slight reduction out employment was still good. Iron and steel works continued very well employed, and the engineering and shipbuilding trades were still working at high pressure with much overtime. The tinplate trade showed some improvement, and the other metal trades were very busy, especially on Government work.

There was a slight improvement in the weaving branch of the cotton trade; in the other sections there was little change. A high level of employment was maintained in the woollen, worsted and hosiery trades, and there was an improvement in the jute, silk, bleaching, calico-printing, dying and finishing trades, and in the plain net section of the lace trade. On the other hand there was some decline in the linen trade.

The boot and shoe trades continued fully employed both on Army contracts and on ordinary work, and there was still great activity in the leather and ready-made clothing trades on Government orders. The bespoke tailoring, dressmaking and millinery trades showed a seasonal decline. There was a further falling off in the silk hat trade, but the improvement in the felt hat trade was maintained. The number unemployed in the building trades increased slightly, but was still very low. In the brick and cement trades there was also some decline. Millsawyers and coachbuilders were busy on Government orders, and employment in the furnishing trades continued fairly good.

Employment with papermakers, letterpress printers and bookbinders showed a slight improvement ; with lithographic printers it continued fairly good. The glass and pottery trades were, on the whole, rather better employed than in June. The food preparation trades were very busy with much overtime, but the fishing industry was greatly restricted by the war. In agriculture there was some difficulty in dealing with the hay harvest owing to shortage of labour, but farmers were generally abreast of their other work.

Dock labourers in London and Liverpool continued very busy, and employment was good at other ports except on the East Coast and in Ireland. The shortage of seamen was less marked than in previous months.

COMPARISON WITH JULY, 1914.

Comparison with a year ago are much affected by the special circumstances arising out of the war. In the iron and steel, engineering, shipbuilding, woollen, hosiery, boot, leather, ready-made clothing and food preparation trades employment was very much better owing to war contracts. The coal mining and building industries were working with much reduced staffs, but those remaining were more fully employed. The numbers employed in the textile trades (except woollen and hosiery) showed a falling off, but the average earnings of those still employed in these trades were higher except in the linen trade, which was not so busy as in July, 1914. The average earnings in the pottery, glass, brick and cement trades were also higher than a year ago. On the other hand the number of tinplate mills in operation still showed a great decline—*The Board of Trade Journal.*

INDIAN TEA.

35,700 packages have been offered during the week. Common and plain liquoring medium kinds declined, but all Teas with good flavour or appearance were firm to occasionally dearer. There was an improved demand also for the few better grade Darjeelings. 38,900 packages are printed for next week. 40,000 packages were offered in Calcutta on the 18th instant, the quality was poor, and prices were lower.

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended August 14 ...	8,116,299	5,211,077	210,209	813,193
For 33 weeks ended August 14 ...	186,179,502	186,849,146	31,465,709	34,396,764

—*The Produce Markets' Review.*

WEIGHTS AND MEASURES.

Proposed Uniform System of Weights and Measures in British India.

The Weights and Measures Committee, formed in 1913, to consider the question of a uniform system of weights and measures for India as a whole, or for specific provinces, have now drawn up their report.

In their conclusions the Committee state that the evidence received shows a general necessity and desire for a uniform system, provided that this does not involve too radical a change from existing practice; and they consider that uniformity, subject to this proviso, is both advisable and desirable. The great majority of witnesses throughout India, except Madras, have advocated the Bengal or Indian Railway weights as the system to be adopted. The Committee recommend the adoption of this system, the introduction of which involves a more or less considerable change of system in parts of the United Provinces, in practically the whole of Madras, and in parts of the Punjab, Bombay, and the North-West Frontier Province. The Indian Railway weights system referred to is as follows:—

8 khaskhas	= 1 chawal	12 mashas or 4 tanks	= 1 tola*
7 chawals	= 1 ratti	5 tolas	= 1 chatak
8 rattis	= 1 masha	16 chataks	= 1 seer
3 mashas	= 1 tank	40 seers	= 1 maund

*Tola = 180 grains.

It is recommended that as regards Burma the present Burmese system of weights should be kept in force.

The Committee makes the followiug recommendations regarding measures: –

LENGTH.—The unit for measures of length to be the British yard, but with permission to recognise Indian and Burmese measures standardised so as to bear a direct relation to this unit.

AREA.—For measures of area the squares of any authorised measure of length to be used for small areas. The British acre subdivided decimally should be used for agricultural land.

CAPACITY.—The chief local measures of dry capacity to be standardised at the most suitable integral multiple of a measure made to hold 1¼ seers of water at a temperature of 86 deg. F., or 30 deg. C. In addition there should be such other local measures as may be deemed necessary in proportion thereto.

Liquids to be sold by any authorised measure of dry capacity or by weights, with permission to use measures made to contain definite weights of particular liquids for selling small quantities of those liquids.

The British cubic measure, or the cube of any authorised measure of length, to be the measure of cubic content.

The report may be consulted by United Kingdom firms interested at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E. C.—*Export World and Commercial Intelligence.*

According to the "Malay Mail," the Indian death-rate on Selangor estates during 1914 was 28·5 per mille as compared with 29·7 per mille in 1913, 37·2 per mille in 1912, and 60·3 per mille in 1911. The healthiest districts were, as usual, those on the coast, where the majority of estates consist of low-lying flat land.—*Tropical Life.*

Members of District Associations who have joined the Army.

MUNDAKAYAM PLANTERS' ASSOCIATION.—2nd Lieut. C. Byng Hall, 4th Suffolk Regiment.

CORRESPONDENCE.

Peermade.
13th October, 1915.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—The following is for Mr. Aylmer Martin's eye, and I trust he will find the suggestion practicable :—

It is well known that knowledge of the vernacular is of the first importance to Superintendents of Estates but how many could pass a good test examination in their coolies "lingo"? The reason for this is the lack of proper "moonshis" I venture to suggest. The ordinary office writer or other writer does not know how to teach—the moonshi does. Cannot the Labour Department send reliable men up to Estates to supply this want?

Yours faithfully,
"TAMIL."

WORLD'S COFFEE PRODUCTION.

(By Foreign Trade Department, National City Bank of New York, August 16.)

The continued discussion of the possibility of a Brazilian coffee valorisation movement in the current year, to which attention was called in these reports on June 30th, lends interest to the statistics of world coffee production and consumption, especially in view of the fact that the United States alone consumes over one-third of the coffee of the world.

The coffee crop of the world for the current crop year, 1915-16, is now estimated at about 20,000,000 bags, indicating that the production of the current year will be the largest ever recorded, except that of 1906-07, when the total was about 23.800,000 bags. Nearly three-fourths of the world's coffee is now produced in Brazil, her share of the coffee production having advanced from less than 50 per cent. in the period 1870-80 to 71 per cent. in 1913-14, while in 1906-07, the year of high-record production, Brazil supplied 84 per cent. of the total product. The estimate for the year 1915-16 is:—Total product, 20,000,000 bags; Brazilian product, 15,000,000 bags, or 75 per cent. of the estimated total.—*Simmons' Spice Mill.*

FEDERATED MALAY STATES.

RUBBER EXPORTS DURING AUGUST, 1915.

The following figures of the exports of cultivated rubber from the Federated Malay States during tne month and eight months ended 31st August, 1915, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for 1914 being added for purposes of comparison :—

	1914. Tons.	1915. Tons.
August ...	... 1,850	3,706
January—August	... 18,671	26,673

—*The Board of Trade Journal.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 44.] OCTOBER 30, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

The Scientific Officer has returned to Headquarters and will probably go on tour again early next month.

The Director of the Labour Department writes that he has gone to Srivilliputtur to make arrangements there for his work, caused by the sadly unexpected death of Mr. Ward—a sad loss to the Department—and that the date of his return to Headquarters is uncertain.

On account of the resignation of Mr. Guy Owen, our Representative on the London Chamber of Commerce, who has been made a Major in the A. S. C. and is consequently unable to perform the duties of Secretary and Treasurer to the South India Planters' War Fund, new arrangements have been made or are in the course of being made, and we hope by next issue to be in a position to inform subscribers that those arrangements are satisfactory in every way and are working smoothly, and that those members of the Planting Community who have joined His Majesty's Forces have been informed of the existence of the War Fund.

The Chairman has asked us to issue a personal appeal to all members of all planting districts to give their cordial co-operation to the Peoples Park Fair and Exhibition, by taking a personal interest in it and making the exhibits of the South Indian planting produce thoroughly representative and helping to ensure the success of this exhibition, the success of which the Chairman has very much at heart, and will be personally obliged to each and every member if he will do his best to second his desire that the Exhibits should be of the best and thoroughly representative. Members are requested to place themselves in communication with their Honorary Secretaries to whom all details will be sent. It is a unique opportunity amounting to an advertisement of all the products of South India and should be taken advantage of by all Districts, and the ultimate object is laudable namely to "afford direct help to the immediate and temporary interests of the Madras War Fund."

DISTRICT PLANTERS' ASSOCIATIONS.

Mundakayam Planters' Association.

Proceedings of the Quarterly General Meeting of the Mundakayam Planters' Association held at the Mundakayam Club. on the 9th October, 1915.

PRESENT.—Messrs. J. J. Murphy (Chairman), A. Hamond, (Vice-Chairman), R. Harley, H. M. E. Howson, H. B. Kirk, T. H. Fitchett, S. P. Eaton, E. Vincent, F. Simmons, D. U. Somers, E. E. Eyre, W. E. Stephen, R. Macpherson, J. A. M. Johnstone, and G. West (Honorary Secretary) and by *proxy*, Messrs. J. R. Vincent, G. H. Danvers Davy, W. A. Asher and W. Hendry, *Visitor*—Rev. J. Henry Osmaston.

The Minutes of the last Meeting were read and confirmed.

U. P. A. MEETING.—The following report was read by the Delegate, Mr. J. J. Murphy :—

BANGALORE MEETING.

Gentlemen,—It ought not really to be necessary for the Bangalore Delegate to make a report at all as the Book of Proceedings should give Association Members all the information they require and in the belief that the Book would be in circulation before this Meeting I took no notes and have now to rely on my memory.

I hope you will approve of my action in having objected to certain remarks made in the Planting Member's report. The reason why I withdrew my resolution on this matter has already been explained by me in the columns of the "Planters' Chronicle." I also withdrew my resolution asking that the Labour Department should pay something towards the general expenditure of the U. P. A. on acreage subscribing to it but not subscribing to an Association. I withdrew this because it was stated that the Budget for the new year, which, unfortunately, I did not hear read, provided for a payment by the Labour Department of a larger sum than would be payable under my resolution. Had this been told me previously it would have saved the time of the Meeting but Mr. Martin would then have been deprived of an opportunity of making a rather bitter attack against this Association.

The Chairman allowed Mr. Martin to bring to the notice of the Meeting the correspondence Mr. Hamond had with the Deputy Director Mr. Day. I thought and still think the Chairman's ruling on this point was entirely wrong, but did not press my objections as I said I would be sorry if anyone were to believe that my Association was in the least ashamed of the action it had taken. After a speech from Mr. Martin to which I replied, a rather colourless resolution was passed, and, if it has soothed Mr. Day's wounded feelings, I do not think we need object.

The Director of the Labour Department's report was published in full in the "Planters' Chronicle." There is nothing in it at all likely to induce any of you to pay your 2/- per acre and join the Department.

The new Scientific Officer Scheme was approved of and agreed on. Acting on the instructions you had given I refused to bind this Association for five years. The Guarantee Fund is, I see, on to-day's Agenda, so it is unnecessary for me to refer to it here except to say that I guaranteed nothing on your behalf.

An interesting lecture on fertilisers which you will all no doubt have read in the "Planters' Chronicle" was delivered by Mr. Anstead and Dr. Coleman also gave a lecture which although meant for coffee men was of great interest to all present.

Rubber, so far as I remember, did not come in for much attention. The Chairman made the very damaging admission that the climate is to blame for what he calls our disappointing yields. Had he told us, as an S. D. recently did in the "Planters' Chronicle," that the real cause of the trouble was too close planting, too rapid excision of bark and other kindred faults, there would have been some hope for us. These mistakes can in course of time be remedied whereas nothing we may do will alter the weather. When I heard the rain at 5 this morning I made some average strong remarks myself about our climate, but there cannot after all be much wrong if our mature rubber is, as may be inferred from what Mr. Richardson said, giving 300 lbs. per acre at the F. O. B. figures quoted by him.

I cannot think of anything else likely to interest you but as I may have omitted several things you would like to hear of, I shall be glad to answer as far as possible any questions you may care to put,

The report was adopted and a vote of thanks to Mr. Murphy proposed by Mr. Vincent and seconded by Mr. Kirk was unanimously carried.

Town Improvement Committee.—The report of the Sub-Committee was read by Mr. Kirk. As the Commissioner, Mr. Robinson, is expected to visit Mundakayam at an early date it was decided to ask him to give the Chairman, Sub-Committee and leading merchants of Mundakayam an opportunity of discussing the Association's proposals with him. A vote of thanks to Mr. Kirk and members of the Sub-Committee was recorded.

Registration of Carts.—Mr. Hamond proposed and Mr. Howson seconded the following resolution :—

> "That Government be approached on the subject of Registration of Bandy men who ply for hire and who receive advances for the purpose of transporting goods from one place to another."

The Chairman said that Mr. Hamond seemed to be a day behind the fair. Government was approached on this subject after our last Meeting and the Chief Secretary replied that there was no legislation empowering the registration of vehicles. The obvious remedy was to ask for legislation and he, therefore, proposed the following amendment :—

> "That the Planting Member Mr. Richardson be asked to introduce into the Legislative Council a Bill providing for the registration of all vehicles in use on public roads and that the support of all other Travancore Associations be asked for this resolution."

Mr. Hamond withdrew his resolution in favour of the amendment which was then put to the Meeting and carried unanimously.

Planters' War Fund.—Mr. Edwin Vincent proposed

1. "That this Meeting cordially approves of the Planters' War Fund and hopes that it will be liberally supported by all Members."
2. "That the attention of Proprietors and their Agents be called to the Fund."

and said :—

Mr. Chairman and Gentlemen,—The Resolution standing in my name and which you have just heard read is a straightforward and simple one

devoid of any intricate phraseology and as such requires no explanation from me. I will ask you however to listen to a few words I have to say in support of it and I will begin by outlining some of the arguments which may be expected against it and meeting them to the best of my ability. First of all then I anticipate opposition on the grounds that members already subscribing to various War Funds cannot be expected to subscribe to this additional Fund. It is not my purpose here to belittle any of those excellent funds like the Imperial, the Madras, Prince of Wales, Red Cross etc., nor is it my intention to ask you to divert your present contributions from any of these to the Planters' War Fund. At the same time, I put it to you, Gentlemen, that these funds will not help the Panters who, after the war, find themselves in Europe, practically penniless and whose only chance of obtaining re-employment is their return to this country to take up again the profession they dropped when they went out into the corners of the Earth to fight our battles for us.

Every man is one of a community and you may be certain that other communities are now making arrangements for the re-employment of their fellows at the end of the war. It is up to us then to see that our men are given every opportunity of returning to India and for this reason I ask your generous assistance.

There is another class of Fund, Sir, to which many South Indian Planters are subscribing and this class I will call "Equipment Funds." By that I mean funds for Aeroplanes, machine guns and the like. Now I may be accused of partisanship but I maintain that people living abroad like ourselves, are being educated by certain papers widely read overseas, in the belief that Government have not done their duty by the Army and the people in the matter of equipment. This, I think, is entirely false and I am sure that if there is a shortage, for example, of Aeroplanes it is not for lack of Government orders. I am convinced that the output of Aeroplanes at Home is only restricted by the supply of labour and the men to fly the machines. You may subscribe your Rs. 33,000 or twice that amount but you will not increase the output of Aeroplanes by so doing. I appeal particularly, then, to those of you who are hesitating as to where to put your money. I ask you to carefully study the aims of the different funds and decide for yourselves if you can do better than support the Planters' War Fund for the benefit of your own chums. I doubt it.

Meeting another contention, Sir, Posterity will certainly be called upon to pay in taxes etc. a goodly proportion of the cost of this war. Our fellows are undoubtedly fighting for a cause which will benefit us far less than it will the next generation. It is only right then that posterity should pay for its freedom from any suspicion of a German yoke for many years to come. But posterity will not pay for the immediate needs of our brave fellows. That is what appeals to me so strongly in this Planters' Fund. Succeeding Governments must make provision for the widows and orphans, for the disabled men and for the dependents of the brave men who are at this moment making history and our present Government are doing I am sure, everything possible as far as equipment is concerned to bring the war to a successful conclusion, but we alone, Sir, stand between a good many planters and poverty and our help is particularly required for the disabled as the pension allowed by Government is as you know not much for a planter to live on.

I appeal now to those S. Ds. who, like myself, can boast only of limited incomes. I ask them to remember that nine-tenths of the men from this

district who have gone to the front are S. Ds. Is it not more suitable then for you to help your old pals than to give your money to a fund which although you may be sure is doing good in a general way is not giving you a visible return for your money as the Planters' War Fund will do? Some of you first and second year men who are finding it a close fit to live on your salaries will have to make sacrifices no doubt, but if you take Mr. Murphy's advice and go through your expenses I am sure you will find room for some little economy which will enable you to help the Fund along.

I have heard it freely said that Mundakayam is already doing its bit but personally, Sir, I cannot recollect having seen any public announcement of our generosity, with the exception of the original War Fund list which came to over Rs.1,000. This was a year ago and since then we have only had the Cigarette Fund before us. I do not know of course what people are giving privately but publicly, as a District, I venture to suggest that Mundakayam has done very little indeed. It would be interesting to know how much the district has subscribed to the War Funds during the year. In any case I understand the Billiard Table debentures at the club were taken up freely enough which does not seem to indicate much pecuniary embarrassment owing to indulgence in war funds.

In conclusion, Gentlemen, let me remind you that this fund is the child of a Mundakayam man, the pioneer planter of this district. Do not let it be said of us that our prophet is without honour in his own country. Think, Gentlemen, of the prestige of Mundakayam and let us place ourselves at the head of subscribing districts with no uncertain voice. I ask you to pass the hat for your credit's sake and Pay! Pay!! Pay!!!

Mr. Kirk, while approving of the Fund, said that he considered Mr. Murphy was wrong in having mentioned at Bangalore a sum which he thought junior S. Ds. should give. He also said that these War Funds are a heavy tax on married men.

The Chairman admitted having said that he would be disappointed if junior Assistants did not give at least Rs.75 each. He mentioned this figure as a guide, but the Fund is of course a purely voluntary one. He hoped that each man would give what he conscientiously thought right without reference to what his neighbour, with whose circumstances he cannot be fully acquainted, may be giving. As regards married men, the Chairman added that Mr Kirk should remember that a man with a wife and say three children owes five times the gratitude to our soldiers that a bachelor does.

The resolutions were unanimously carried and subscription lists were circulated, Rs. 1,950 was promised.

AEROPLANE FUND.—Mr. Kirk said that he had promised to call the attention of the Meeting to Mr. M. M. Knight's appeal for a Travancore Aeroplane. The Chairman said that he thought members wishing to subscribe for an aeroplane should send their money to the U. P. A. Fund and he hoped Mr. Knight and his Committee would see their way to sending the money collected by them to this Fund also.

Mr. Hamond suggested that instead of an aeroplane a gun should be given to the Royal Horse Artillery. The matter was then dropped.

LAND PURCHASE.— With reference to the prohibitive price for forest land recently fixed by Government, the following resolution was proposed from the Chair:—

"That all Associations in Travancore be written to with regard to the prohibitive rates now demanded by Government for forest

land, so that combined action may be taken through our Legislative Council Member Mr. Richardson, with a view to the Coffee Land Rules being adhered to."—Carried *nem con.*

CIGARETTE FUND—An interesting report was read by Mr. Kirk who was thanked by the Meeting for the work done by him.

LABOUR.—Mr. Kirk complained of a letter written to the "*Madras Times*" in September by Mr. T. Srinivasa Mudaliar and said that he thought some action should be taken by the Association.

The Chairman said,—"The letter Mr. Kirk complains of really concerns Districts under the Madras Labour Act and very evidently is not meant as an attack on Travancore Planters. As however there does appear to be a certain amount of loose talk concerning the way estate labour is treated in South India, I propose the following resolution :—

'That the Chairman and Council of the U. P. A. be asked to consider the advisability of petitioning the Governments of Madras, Mysore, Travancore and Cochin to have a thorough investigation made into the conditions under which labour is employed in Estates, as statements such as that made by Mr. T. Srinivasa Mudaliar in the *Madras Times* of the 21st September may interfere with the supply of estate labour unless promptly refuted—'

As you know, Gentlemen, we have nothing whatever to fear from a Government enquiry. Our labour is well treated, happy and healthy."

The resolution was carried unanimously and the Chairman then said :—

"We now come to the resolution forwarded to us from the Anamalai Planters' Association. It reads :—

'That the rate of pay current in the district to be binding on all members of A. P. A. shall be annas 5 per man and 3½ annas per woman for all contracts to work from April 1st, 1916 and that advances be limited to Rs.10 per head for Tamil coolies, provided that the Mundakayam Planters' Association will agree to reduce their present rates similarly.'

I do not know why Mundakayam was favoured with the Anamalai P. A's kind attention as I believe other districts also give more than the rates mentioned in the resolution quoted.

I propose that the following reply be sent by our Honorary Secretary :—

'With reference to the resolution quoted in your recent letter, my Association does not understand why you only ask for its support and not for the support of other districts paying similar rates to it. My Association does not consider that rates or advances in this district are excessive. It considers that having regard to the great increase in cost of living for the cooly during recent years and to the good profits now being made off tea and rubber estates, the present would be a most inopportune time to reduce rates, and that any reduction would be unfair to labour.'

'My Association is also of the opinion that it is better to pay rates which permit of coolies going annually to their villages with decent balances than to have to give advances as is apparently done in at least one district, when labour requires a holiday.'"

This was unanimously agreed on after several members had expressed their surprise at the action of the Anamalai P. A.

CATTLE POUND.—Mr. Kirk reported what he had done and read a letter from the local Magistrate with reference to the appointment of a pound keeper. It was resolved to refer the matter to the Commissioner.

GUARANTEE FUND AND BENEVOLENT FUND.—The attention of the Meeting was called to these two Funds. Subscription to the latter had however been recently collected and no one was willing to put his name down for the former.

PEERMADE-MUNDAKAYAM LABOUR RULES.—It was agreed to leave this subject for the Committee to go into. A resolution will, if considered advisable, be proposed at the next Meeting.

SRI MULAM DELEGATE.—Mr. West kindly consented to represent the Association.

AUDITOR.—Mr. H. M. E. Howson was unanimously appointed.

BACKWATER TRANSPORT.—The Madura Company's proposals were approved of but it was felt that this is not an Association matter.

THE NEXT MEETING will be held on the 8th January, 1916.

A vote of thanks to the Chairman closed the Proceedings.

(Signed) J. J. MURPHY,
Chairman.

(„) G. WEST,
Honorary Secretary.

Wynaad Planters' Association.

Proceedings of a Meeting held in the Meppadi Club, on the 13th October, 1915.

PRESENT.—Messrs. J. C. Blackham, R. Copland, T. S. Gillatt, B. Malcolm, D. H. McLeod, S. H. Powell, H. B. Winterbotham, and N. C. Whitton (Honorary Secretary.)

Mr. Malcolm in the Chair.

1980. SIR HAROLD STUART'S VISIT.—It was resolved.—"That the Proceedings of the Meeting of Wynaad Planters held on the 14th September 1915 be recorded in the Association's Minute Book."

1981. PROCEEDINGS OF LAST MEETING were confirmed.

1982. POST OFFICES—(*a*) Read letter from the Postmaster-General, Traffic, Madras, to the Honorary Secretary, stating that the telegraphic working hours of Meppadi combined Office have been altered to 10 to 17 hours with effect from the 1st September 1915.

b) Read copy of letter from the Postmaster-General, Traffic, Madras, to the Collector of Malabar, informing him that orders had been issued to bring the Calicut-Vayitri Telegraph Section into use again as soon as the line is restored to its normal condition.

Both of the above were recorded with satisfaction.

1983. ROADS.—Read correspondence with the District Board Engineer with reference to the bridge at mile 1/3 on Road No. 31, Noted.

CALICUT-MYSORE FRONTIER ROAD.—Letters were read between the Executive Engineer, West Coast Division, and the Honorary Secretary, with reference to this road. It was resolved :—" That the Honorary Secretary be requested to address the Chief Engineer, P. W. D., Madras, pointing out that all expenditure has been stopped on the Calicut-Mysore Frontier Road for want of Funds, and that our interest will suffer greatly if repairs are not completed before the end of the N. E. Monsoon,—specially referring to the roadway between miles 30 and 33 on the Tamaracherry Ghaut Section."

Read letter from the Honorary Secretary to the Acting Collector, pointing out the great damage now being done to the Tamaracherry Ghaut by narrow tyred timber carts. No reply having been received, the letter was recorded.

1984. CATTLE TRESPASS.—Read correspondence between the Honorary Secretary and the Acting Collector of Malabar. It was decided for the information of Members to print the Acting Collector's letter in the Association's Proceedings.

Members are requested to keep a record of the number of cattle found grazing on their Estates for a short period.

1985. U. P. A. S. I. MEETING.—Mr. Malcolm read the Delegates' report as follows :—

GENTLEMEN,

As your Delegates, we attended the Annual Conference of the U. P. A. S. I. which opened in Bangalore on the 16th of August.

It is to be regretted that copies of the Book of Proceedings of the Meeting have not already reached you. Your Honorary Secretary has however been informed that they are in the hands of the Printers and that the delay lies with them. He hopes to be able to receive and issue them to you before very long.

The Conference opened with the usual interesting reports of the Secretary, Chairman, Planting Member, and Scientific Officer. These you have doubtless read in the Madras Papers.

The first item of the Agenda of particular interest to us was the reorganisation of the *Scientific Officer's Department.* Mr. Chadwick, the Director of Agriculture, was present, and very kindly gave us details of what Government were prepared to do. After some discussion as to the financial side of the question and as it was made clear at the Meeting that Associations would not be called upon to increase their subscriptions, and that there was no intention of opening up more experimental stations than could be effectively dealt with, it was unanimously decided to accept Government's offer of taking over the present Department. We were instructed to ask you to do your utmost to assist the U. P. A. S. I. in their guarantee, by recommending the scheme to your employers and by pointing out that Science in Planting in South India is a very long way behind what it is in other countries, by our hitherto not having had a Scientific Department staffed with all the necessary Officials.

A personal guarantee Fund was started in the Room in connection with the scheme and we ask for your support.

COCHIN HARBOUR AND THE PROPOSED SHORANUR-WYNAAD RAILWAY were the next items of interest to our District. We of course

supported the former. In the case of the proposed Shoranur-Wynaad Railway, you will have noticed that the resolution was brought forward by your Delegates. We were asked to do this as it was pointed out to us, that the original idea of a Railway through the Wynaad came from our Association many years ago, and we were therefore glad,—for sentimental reasons, as much as any other,—to have had the opportunity of bringing forward the subject again.

Since the Bangalore Meeting we have been honoured by a visit here from Sir Harold Stuart, the Hon'ble Mr. Murray and the Hon'ble Mr. Barber, for the purpose of looking into the question of this Railway, and we must hope they left us resolved to see the scheme through.

All matters in connection with *the War* and *the dealing with alien enemies* we supported in accordance with your instructions.

The question of *Shipping freight* was put forward by the Delegates from the Kanan Devan Association who brought to light some astonishing figures as to the difference in freights to London from Calcutta as against certain other East Coast Ports, and we supported the resolution which followed.

A very eloquent Report was read by the Director of the *Labour Department* and a statement of that Department's accounts was laid on the table. Members of the Labour Department can congratulate themselves on the result of the first year's working. Mr. Aylmer Martin made some strong remarks with reference to high advances which, in the interests of Labour generally on Estates in South India, are applicable to non-subscribers as much as subscribers.

With regard to the position of non-subscribers who are Members of the U. P. A. S. I., a Statement was made by the Chairman to the effect that non-subscribers are in the same position as before the Labour Department was started, and the U. P. A. S. I. is not responsible in any way for the financial position of the Labour Department.

Before concluding this Report we must bring to your notice, and invite your subscriptions, to two Funds which were started at the U. P. A. S. I. Meeting. The first is the "Southern India Planters' War Fund" and the second is in conjunction with the "Overseas Aircraft Fund." In the case of the former, Mr. J. J. Murphy's excellent appeal requires no furthering from us, and we all know the exceedingly important part Aircraft are playing in the present War.

These, we think, Gentlemen, are all the points brought out at the Meeting which are of special interest to this District. We shall be very pleased to answer any question you may now wish to ask us and we thank you for the honour of having had the interests of this Association entrusted to our care.

(Signed) B. MALCOLM.

(„) N. C. WHITTON.

A vote of thanks to the Delegates proposed by Mr. Gillatt and seconded by Mr. Powell was unanimously passed.

1986. SOUTHERN INDIA PLANTERS' WAR FUND.—It was decided that the Honorary Secretary circularise members, and members were requested to let the Honorary Secretary know what they are willing to give either as a subscription or donation.

1987. OVERSEAS AIRCRAFT FUND.—Mr. T. S. Gillatt very kindly undertook to collect subscriptions for this Fund.

1988. LABOUR LAW.—Correspondence was read with Mr. E. R. Osborne with reference to the Association's High Court Case. Noted.

Read Mr. Copland's letter to Messrs. Harrisons & Crossfield, Ltd. re a Maistry case of his. The Meeting recommended Mr. Copland to await the decision of the High Court on the case now before it.

1989. BENEVOLENT FUND.—The Honorary Secretary drew the attention of members to the need of members subscribing to this Fund. A copy of the Report for the past year's working was laid on the Table.

1990. PRODUCE THEFTS.—The Judgment in Mr. Hudson's Pepper-stealing case was read and the following resolution unanimously passed.

"That this Association notes with satisfaction that a conviction was secured in the case of a detected theft of Pepper, the property of Mr. R. K. Walker; and records its appreciation of the keenness displayed by the South Malabar Police during the past season and especially by Circle Inspector K. Atchuthan Nair."

PAPERS ON THE TABLE.—Notices of the South India Athletic Association Annual Sports and Show in aid of the Madras War Fund.

A vote of thank to the Chair terminated the Meeting.

(Signed) B. MALCOLM,
Chairman.

(„) N. C. WHITTON,
Honorary Secretary.

BRAZIL. PERU. BOLIVIA.

EXPORTS OF RUBBER FROM THE AMAZON BASIN, *via* PARA, IN JULY, 1915.

	Fine.	Medium.	Coarse.	Caucho.	Total.
	Kilogs.	Kilogs.	Kilogs.	Kilogs.	Kilogs.
To United States ...	485,862	112,702	446,900	518,046	1,563.510
To Europe ...	299,004	29,603	16,499	20.876	365,982
Total ...	784,866	142,305	463,399	538,922	1,929,492

Kilogs.—2·2046 lbs.

—*The Board of Trade Journal.*

STRAITS SETTLEMENTS.

RUBBER EXPORTS, AUGUST, 1915.

According to telegraphic information received by the Malay States Information Agency in London, the exports of rubber from the Straits Settlements for the month of August amounted to 2,295 tons, as compared with 2,324 tons in July, 1915, and, 1,325 tons in August, 1914. (These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, Sumatra and Non-Federated Malay States.)—*The Board of Trade Journal.*

CORRESPONDENCE.

Superintendent's Office,
Mangalore, S. Canara,
October 22nd, 1915.

Labour Department.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—With reference to the letter from *Vive et Vivas* in your issue of 16th October :—

In my reply to his first letter I must have displayed an ire I did not feel. Nobody denies the fact that Peermade employed Tinnevelly Labour, and does still employ them, but far from only the remains of them being in the district to-day, I am of opinion that there is more Tinnevelly Labour in Peermade than ever before. I know as a matter of fact that the 19,000 coolies on the High Range are the legitimate expansion of the very small connection I mentioned. With all other planting Districts I can say the same, their present labour forces are the outcome of very small beginnings. The reason why Peermade planters did not expand in the same ratio is that they found labour cheaper to get elsewhere than from Tinnevelly. They were outbid by the Ceylon men to whom *Vive et Vivas* alludes, who knew no other way of getting labour than to advance as high as they thought necessary. My last letter has been twisted into a demand for following self-interest at the expense of unity. Whereas it must be obvious from everything I have ever said, that unity is necessary from motives of self-interest,

Some 6 or 7 years ago I publicly challenged anyone to produce a single instance of a Kangany or cooly on the High Range who was indebted to any estate outside that district. There was no reply from Peermade or elsewhere. I again repeat, that wherever the High Range labour force came from it was not from Peermade. That district held its own and still holds it, but it did not increase its labour force from Tinnevelly, for reasons I have given. The estate now worked by *Vive et Vivas* may have lost its former Tinnevelly connections. Let him look nearer than the High Range, to see what became of them. It is not a matter of recent years, and probably not a man now in Peermade knows how or when the loss occured. It must have been a slow and gradual process.

I daresay *Vive et Vivas* has heard of the once flourishing planting district of Ashamboo, but he probably does not know what became of its labour force. The following deserves to be rescued from oblivion. Among the 60 or 70 European planters there, was an S. D. named Shervington. He must have been a man of more than ordinary enterprise, though he did not stick long to planting. He afterwards became Commander-in-Chief of the Army of Liliukalani, Queen of Madagascar, and was beaten by the French. A British Man-of-War took him off that island when the game was up, an honour to which I fancy few former S. Indian planters have attained. The estate on which Shervington worked (I regret I forget its name) drew its labour from certain villages in Tinnevelly district, which still supply coolies to Peermade.

Yours faithfully,
AYLMER Ff. MARTIN.

SOUTH INDIAN PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	17,570	0	0
Mr. R. H. Crowther	10	0	0
Messrs. Siemen Bros. Dynamo Works, Ltd. ...	5	0	0
Mr. J. H. J. Jones	100	0	0
Mr. J. C. Blackham	13	0	0
Mr. H. M. Northey	100	0	0
Mr. E. C. Kent	40	0	0
Messrs. Barber & Pascoe...	75	0	0
Mr. R. C. Foster	30	0	0

Subscriptions promised at a Meeting of the Mundakayam Planters' Association on the 9th October, 1915—

	Rs.			
A. Hamond, Esq.	150			
G. West, Esq., Rs. 20 per month for 5 months ...	100			
H. M. E. Howson, Esq. In two half yearly payments	120			
E. Vincent, Esq. Rs. 10 per month for 12 months.	120			
F. Simmons, Esq. Rs. 15 per month for 12 months.	180			
E. E. Eyre, Esq. Rs. 25 ,, ,, ...	300			
R. Harley, Esq. (Second Subscription) ...	300			
J. A. M. Johnstone, Esq. Rs. 5 per month for 12 months	60			
Yendayar Estate	160			
S. P. Eaton, Esq. Rs.10 per month for 12 months ...	120			
T. H. Fitchett, Esq. Rs. 15 ,, ,, ...	180			
Pambadampara Estate	160			
		1,950	0	0
Total Rs...		19,893	0	0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed	2,352	8	0
Terramia Estate	100	0	0
Mr. O. W. Marden	50	0	0
Total Rs...	2,502	8	0

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended September 18 ...	4,848,539	434,987	2,029,141	1,209,349
For 38 weeks ended September 18 ...	212,111,245	218,520,037	37,626,749	39,337,210

—*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 45.] NOVEMBER 6, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Officer publishes a report on a Tour in South Mysore. It is a most interesting report and from the Experimental Plots laid down by the Scientific Assistant not only will the practical planter receive visible proofs of the effect of spraying, but the Assistant Scientific Officer himself will receive direct encouragement which in itself is a valuable asset. When nearly every planter owns a motor there is no excuse for not visiting these experiments. The article is most valuable contribution to the practical and full of suggestive hints.

The Proceedings of the Bababudin Planters' Association are published. Those of the Central Travancore Association arrived too late to appear in this issue of the *Chronicle* but will appear next week.

We publish from *Nature* an interesting article by Sir William Ramsay on the Future Competition with Germany. We would refer in connection with this to the admirable letter of Mr. Welby on the European Association in Madras, read at the Annual General Meeting, which is reprinted in the Book of Proceedings of 1915. Free from exaggeration or virulence it inculcates the way German competition should be combated. The letter we publish is a very informatative one.

Mr. Aylmer Martin contributes to our correspondence columns.

The Director of the Labour Department U. P. A. S. I. is still detained at Srivilliputtur in connection with the late lamented Mr. Ward's death.

The Scientific Officer proceeds on tour on the 10th, first visiting Malabar.

Mr. F. D. McFarlan, a partner of Messrs. Leslie & Anderson, has kindly consented to undertake the duties of Secretary and Treasurer to the War Fund, in place of Mr. Guy Owen, whose military duties prevent his undertaking them. He is well known to many planters in Southern India.

Messrs. Parry & Co., Madras have kindly consented to receive exhibits for Madras Exhibition which should not arrive later than December 24th.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Report on a Tour in South Mysore.

Leaving Bangalore on 16th October and returning on 30th, I made a short tour of the Belur, Mudigere, and Saklespur Districts of South Mysore, visited a number of Estates, and inspected the Experimental Plots laid down by the Scientific Assistant.

These latter I found of very great interest, especially the experiments designed to show the effect of spraying the Coffee at different seasons with Bordeaux Mixture on Black Rot and Leaf Disease. The results are very striking, the sprayed plots standing out full of vigorous and healthy leaf in sharp contrast to the unsprayed, thin and depleted of leaf due to the attacks of Black Rot during the monsoon followed by leaf disease, The experiments have gone a long way to prove the efficiency of spraying, and the practical details of the best way to spray large areas, having regard to labour and expense, have now to be worked out. The Scientific Department have demonstrated the beneficial effect of spraying beyond cavil, and it is for the practical planter to suggest the best methods of carrying out the treatment to meet his own local conditions.

This being so it is disappointing to find how very few planters have been to inspect these Experiment Plots and see what is being done. One would have expected from the amount of talk of the damage done by Black Rot and Leaf Disease, and the statement often made that anything which would check the ravages of the latter would prove the salvation of the Coffee industry, and so on, that an immense amount of personal interest would have been taken in this work of the Scientific Assistant, and it is most discouraging to find that this has not been the case, and one is inclined to wonder whether it is worth while spending money, time, and a great deal of trouble about work which few will even come to look at.

Destructiva criticism is easy to deal out and as a rule valueless ; anyone who is still sceptical as to the results of spraying coffee with Bordeaux Mixture should go and see these Experiment Plots which will convince him that it can be done and it is the right thing. Should big areas be undertaken the interesting question of the possibility of using power sprayers comes up and the advisability of co-operative purchase of such an out-fit.

In addition to these plots there are some experiments being conducted with different washes to discourage the attacks of Borer, to test the effects of pruning at different seasons, and manurial experiments, all of which are of great interest and very instructive.

In some of the localities which I visited I found Coffee growing poorly in whitish soil which cakes very hard in the dry weather. In this type of soil the roots are very restricted and do not spread out into the soil between the rows. In this case the only objection to deep cultivation disappears, since it can be carried out without cutting the roots which are not there to cut. What is chiefly lacking in such soil is humus and I should advise the opening of trenches down the rows as close as possible to, the Coffee without cutting the roots—*i.e.*, at the limit of the root range, which can easily be ascertained by opening a few trial trenches—and burying in these trenches all the green material which can be obtained, dusting it over with Basic Slag.

In this connection more use might be made of green dressings. It is usually said by Coffee planters that green dressings cannot be grown in established Coffee owing to the shade, cover, and mulch, and the subject is dismissed. This, however, only applies to thick, well established Coffee. In poor soils in need of humus many open spaces will be found where green dressings could be established. *Erythrina* might be planted thickly in such spaces and lopped up to supply the needed organic matter. It would pay too to carry in and bury loppings from hedge-rows and waste spaces. Such treatment would tend to lighten and aerate the soil and the Coffee roots would spread into the trenches and thus gradually extend their range, gaining a bigger feeding area and a bigger field from which to draw moisture in the dry weather. In these brick-like soils, which cake hard in the dry weather and puddle in the wet weather, the roots are being killed for want of air, and naturally the trees suffer unduly from attacks of Black Rot, Leaf Disease, Borer, Scale Insects, &c.

The Green Bug has had an unfavourable year and has been largely kept in check by natural agencies such as the parasitic fungus. It has, however, by no means been exterminated by these agencies and in several places I observed it beginning to put in a fresh appearance. Having received a check, now is the time to keep it under by means of spraying.

In this connection the following extract from an article in the *Monthly Bulletin of State Commission of Horticulture*, reproduced in the October, issue of the *Tropical Agriculturalist* is pertinent :—

"When, *in relation to the abundance of the pest* is the most economical time to adopt control measures in order to prevent injury ? In practically all cases where scale insects are concerned, spraying is delayed until the pest is abundant on the trees. The percentage of kill, when taken alone, has no bearing whatever upon the effectiveness of the treatment. The factor of importance is the *number* of living scales which are left after treatment, not the *percentage*. A kill of 50 per cent would be equally as effective as a kill of 95 per cent., if in the latter case the scale were ten times as abundant as in the former. There would be left to re-infest the tree for the next year an equal number of scales in either case. It might be much easier to get a kill of 50 per cent. in the one case than 95 per cent in the other. As a concrete example, it might be more economical to treat for the brown apricot scale when it is comparatively scarce in an orchard and and thus prevent it from ever becoming a pest, than to wait until it is abundant before attempting control measures. As a general rule, when a scale becomes sufficiently abundant to cause the grower to consider remedial measures, it has already done much damage. This damage might be avoided by the action suggested above. There is some place, a happy medium between spraying only when the scale has become abundant and spraying every year regardless. Spraying at that time could very properly be termed "preventive entomology." and its usefulness ought not to be difficult to demonstrate,"

Nearly every estate I visited has a certain number of Hybrids and these stand out in a most marked manner from the rest of the Coffee in point of view of health and freedom from disease. Unfortunately many of them yield a berry which fetches a low market price on account of the dominance of the Liberian character in its flavour. In some places I found that attempts were being made to increase the number of these Hybrids and to improve the quality of the bean they bear. Most of this work is, how-

ever, waste of time and fore-doomed to failure, becauce it is not being conducted on the right lines. The plan adopted is to take the seed from a likely Hybrid and sow it in a nursery and put out the resulting plants as new clearings or as supplies. The fact that this seed is the result of a further crossing is lost sight of. In one particular case the tree from which seed was taken had next to it several Hybrids of a markedly bad type, and near by ordinary Arabica at its last gasp from old age and disease. Crosses must have been made between these types and the good one by bees and other insects, or even by wind, and the consequence is that the resulting plants threw back and a clearing was obtained of Hybrids which will not bear. Such a result is only to be expected if such methods are adopted. Plant breeding has much in common with animal breeding and this method is like allowing a pedigree cow to run with the herd.

If anything is to be got out of selection from existing Hybrids, and I certainly think a great deal can be got, the one it is desired to reproduce should be carefully selected for health, habit of growth, freedom from disease, bearing capacity, and type of berry, and trees round it should be cut out so as to enable it to be netted in when in flower. Four posts should be erected and over these a mosquito net should be spread so as to completely cover the tree and protect it from insects and wind a few days before the blossom begins to open. After the fruit has set the net may be removed and stored for a future occasion. The seed on this tree will now be self fertilised and a large proportion of it will come true to type and reproduce the tree. The seed should all be gathered and sown in a separate nursery and the plants raised from it planted in a new clearing by themselves. When they declare themselves, those of undesirable type can be removed and replaced if necessary by supplies from future nurseries raised in the same way. Hybrids should be planted about 8 x 10 or 8 x 8 and topped at 5 feet. If clearings were made in this way good results would be obtained, and despite a lower price for the produce the increased health and yield will probably make good Hybrids pay better than the ordinary Arabica, especially when it is old.

Apart from work with Hybrids, however, in my humble opinion far more care ought to be taken about seed selection for Coffee. Little is known about the history of the seed usually put down in nurseries. On most estates the manager can show one "the best tree on the tote—it always looks fit and always yields well.' That is the tree to use for seed and not a berry on it should be used for any other purpose. Again it should be netted to get the best results, but even if it is not, every berry should be gathered and picked over, and only the heaviest and best shaped beans selected. These should be sown in a well made nursery and the plants raised again selected and only the best put out. This should be done every year and no seed should be used unless it is known to be derived from specially marked trees. If care of this sort were taken much better results would be obtained them can be got out of the present methods.

On every estate there are a large number of bad trees which never bear and which no amount of manuring will make bear. It is these which lower the yield per acre and reduce profits; money and labour spent on them gives no return. 140 berries on a tree is equal to a yield of 1 cwt per acre and if every tree 'did its bit' it would not be difficult even in a bad year to get + 5 cwts per acre. It is these bad trees which never give 50 berries even in a good year which do the damage and they should be eliminated, or better

still never planted. They are the direct result of bad seed selection and bad selection in the nursery.

It occasionally happens that when inspecting a new clearing one praises it all but one corner and the excuse given is that this was 'the tail end of the nursery.' Well 'the tail end of a nursery' should never be planted, but scrapped. Small clearings well planted with only the very best plants from the best of selected seed will pay in the long run better than big areas planted with any old kind of plants.

One sometimes sees a bad bit of land planted up to 'square off a clearing.' Again a bad policy: that bad bit which should never have been planted will often swallow up the whole of the profits on the clearing and foredoom it to a poor proposition. Much better to square it up by planting *Crotalaria*, or *Erythrina* which can be cut and used as a green dressing or mulch for the clearing.

How much care has been taken about the selection of the ordinary seed put down? What sort of parents did it come from? What was their history and pedigree? What sort of bushes is the seed *likely* to produce? These are questions which ought to be asked and the answers should be satisfactory. In ordinary estate practice how often is this done? Remember one is sowing a seed to produce a tree which is to live and give a profit one hopes for the next 30 or 40 years. Surely it is common sense to take every precaution and care that the seed is a good one and likely to produce a tree which will fulfil the destiny marked out for it.

I am inclined to think that if an Economic Botanist were to take up the study of Coffee and analyse the types we are growing he would tell us we were lucky to get the result we do and he would probably predict a much worse one. I also firmly belive that it would pay the Coffee Planting Industry of South India to employ a trained Economic Botanist at a good salary to do nothing at all but study the life history of Coffee, and on a specially chosen station to breed one or two new types—hybrids if you will—to suit our local conditions. This is a dream beyond realisation I know but nevertheless I am convinced that were it realised it would pay handsomely.

Why it does not pay to buy low grade fertilisers.

A Correspondent has kindly called my attention to a mistake in the calculation published in my note on the above subject. This is due to a printers error which was overlooked when reading the proof, for which I apologise.

The statement should read—

700 lbs. Coconut Poonac at Rs.1-14-0 per cwt.=Rs.11-11-6,

The quotations from the firm of manure suppliers on which the calculation was based included Coconut Poonac at Rs.1-14-0 per cwt., making it Rs.37-8-0 per ton. Since then the price has advanced to Rs.2-8-0 per cwt., or Rs.50 per ton and this would make the cost of the mixture containing it Rs.32-13-10, instead of Rs.40-10-10 as stated.

This mistake makes no difference to the general proposition, it is not quite so exaggerated as my figures went to show.

RUDOLPH D. ANSTEAD,
Planting Expert,

DISTRICT PLANTERS' ASSOCIATIONS.

Bababudin Planters' Association.

Proceedings of the Annual General Meeting of the Association held at the Santaveri Travellers' Bungalow on October 20th, 1915.

PRESENT.—Messrs A. B. Boyd, (President) W. Barnard, A. C. W. Denne, F. Hugonin, H. Kerr, F. D. Meppen, C. Sylk, S. J. Wilson, and S. H. Dennis (Honorary Secretary). *Visitors*—Messrs. R. C. Morris and J. R. Hugonin.

The minutes of the last meeting were taken as read and confirmed.

(1.) PRESIDENT'S ADDRESS.—Since our last General Meeting the War has been carried on strenuously, in the West the Allies have done more than hold their own, and lately have been giving the enemy a really bad time. In the East things have not gone so well, but now our Russian Ally, after very great sacrifices, is beginning to get a bit of his own back again.

The Dardanelles have proved a much harder nut to crack than we were at first led to expect. I only hope that the new complications which have arisen in the Balkan States will not delay matters, and that our gallant all of Serbia will be able to hold her own against her numerous enemies. The war at present seems no nearer an end than it was six months ago, but we ally believe that the end must soon come, and that peace will be established in such a way that it will be a lasting one. This war will surely teach the British public the folly of free trade, out of which Germany has made the enormous profits which have enabled her to carry on the war in the way she has done.

Nearly all the Estates belonging to this Association sent 1% of their last crop to the Red Cross. Owing to the crops being small, I am afraid the amount sent was not great, but hope it was of some use.

At the present moment two subscription lists are in circulation, the South India Planters' War Fund for the benefit of Planters who have joined the Army, and who may require assistance, and the Overseas Air craft Fund, both of which deserve to be as well supported as possible. The increased and still increasing Taxes at home may, I am afraid, prevent some men giving as liberally as they would like to do.

I am glad to see that Government at last recognize the necessity of much stricter laws with regard to Alien subjects of both sexes, the sooner they are all either interned or repatriated the better.

Last season crops were small. There was great difficulty in getting the crop shipped home, and freight was very high. The Estates that were lucky enough to get their crops on the market early, realized exceptional prices, but later on the price dropped very considerably, and at present, there is great difficutly in selling at anything like the valuation. I hope there will be a great improvement before the coming crop gets home.

From all accounts the coming crop is not going to be a big one but we, on the Bababudins, may congratulate ourselves on having quite average crops, and that in spite of Leaf disease which has been rather bad here and there, Coffee is looking very well for next season.

I am sorry to say, we seem no nearer getting a Dispensary at Santaveri than we were this time last year. Sometime ago the Mulnaad Improvement

Officer, more generally known to the Ryots and coolies as the Lantana Doctor, wrote asking us to pay the whole cost of the Dispensary, *viz.*, Medical Officer, Assistant, Buildings, &c., &c. We pointed out to him that the Dispensary was as much for the benefit of the surrounding Government villages, as for Estate coolies, and that if we were prepared to pay the whole cost, it would only be for Estate coolies, and that Government villages would derive no benefit from it. For example, Oodal 3 miles away, which at present is full of Plague, and 12 to 13 miles from the nearest Medical assistance would derive no benefit. If Government wish to improve the Malnaad, they must first start by providing adequate medical assistance.

The transfer of Mr. Poonappa to another District is a great loss, as ever since he came, he has been doing all in his power to get our roads into order, and I am sure would have succeeded in doing so, had he been given time. He had a difficult job, as the roads were in a bad state when he took them over. I hope his successor will complete the good works Mr. Poonappa has started, and that in time we may all have a good road to Birur, which is the Station for the greater part of the Bababudins.

The Labour Department which has now got into full working order has been of great assistance to a number of Estates, and there is not the least doubt that we shall get our money's worth out of it, in Mr. Martin we have the right man in the right place.

As you know the U. P. A. S. I. Scientific Department is now to be taken over by the Madras Government, and when fully organised ought to be of great benefit to us all. We are deeply indebted to Mr. Chadwick, for all he has done for us in this matter.

I have now to thank our Honorary Secretary for all the good and hard work he has done for the Association during the last year, and I am sure, that when you have seen his statement of accounts, you will say he is a great Financier.

I thank you for the honour you did me in electing me your President, and now place my resignation in your hands.

(2.) HONORARY SECRETARYS' REPORT AND ACCOUNTS,—My report for the past year is as follows :—our acreage is the same as last year, we having 26 Estates, comprising 5,695 acres, on the rolls of the Association.

During the year 2 meetings were held, that is, excepting the Annual General Meeting, and were well attended, one was held in Chickmaglur in April, and one at Santaveri in July.

IMPERIAL INDIAN RELIEF FUND.—R 645 was subscribed by members of this Association to this fund, which sum was duly remitted to the Honorary Secreary of the Fund at Bangalore.

PLANTERS' BENEVOLENT FUND.—All members subscriptions to this Fund were received, and remitted to the Secretary U. P. A. S. I.

ACCOUNTS.

All the books of the Asssociation are on the table. Financially the Association is quite sound, we having, at the close of the past year, after meeting all our liabilities, a credit balance of Rs.2,425-4-8—Rs.2,000 of this I have created a reserve fund with, and have placed it on fixed deposit with the National Bank of India, Ltd., Madras, at 4%. At the close of the

current year, if we have no abnormal expenditure, our reserve found should be still further augmented.

All subscriptions for the past year have been paid, and our only outstanding is a sum of Rs.31 for a Sprayer.

I must now ask the meeting to appoint auditors to audit the accounts and before closing have to thank the President and members for all the help they have given me, and have much pleasure in tendering my resignation.

Messrs. Sylk & Wilson were appointed Auditors.

(3) SANTAVERI DISPENSARY.—This matter again came up for discussion and the Honorary Secretary was instructed to send the Deputy Commissioner, Kadur District, a copy of the resolution carried at our last meeting. The Special Revenue Officer, M. I. S. Kadur and Hassan Districts, having omitted to acknowledge receipt of the copy sent to him on July 14th 1915,

(4) TEA AND CAMPHOR LAND GRANTS.—Government order No. R. 12051-62/L. R. 407-13-4 dated Bangalore the 28th June 1915 was read to the meeting.

(5) SANDERSON MEMORIAL WARD.—Letters from the Deputy Commissioner, Kadur District, dated 4th August, 1915, and from the District Medical Officer, Chickmaglur, dated 28th July, 1915, were read to the meeting, stating, that the reason our subscriptions towards a store room for the Ward had not been utilized. was because the amount required for erecting a store room has not been fully raised by means of subscriptions.

It was decided that this matter be postponed, pending the result of the forthcoming Sanderson Ward Board meeting.

(6) GIFTS OF COFFEE FOR TROOPS AT FRONT.—Read letter from the General Secretary, St. Johns' Ambulance Association, Simla, dated 9th August, 1915, thanking the undermentioned members of this Association for their gifts of coffee:—

(1)	Mr. Claude Courpalais, Sumpigay Estate ...	100	maunds.
(2)	Mr. A. C. W. Denne, Santaveri Estate ...	66	,,
(3)	Mr. S. J. Wilson, Kulhatty Estate ...	40	,,
(4)	Mr. A. B. Boyd, P. H. & Co., Siddabile Estate.	35	,,
(5)	Messrs. Morgan & Son, Kurkenmutty Estate...	28	,,
(6)	Mr. C. Sylk, Kesinvurthy Estate ...	20	,,
(7)	Mr. H. Watson, Planters' Supply Co. ...	20	,,
(8)	Mr. H. Kerr, Gonical Estate ...	6½	,,
(9)	Mr. H. Kerr, Kothencool Estate ...	4½	,,
(10)	Mr. H. Allardice, Mylimane Estate ...	4	,,
(11)	Mr. R. D. Lovett, Gundikhan Estate ...	2¼	,,
		326¼	maunds.

(7) THE ANTI-GERMAN UNION.—The pamphlet received asking us to give our support to the Union was read to the meeting, and those that had not already joined were asked to do so, a general boycott of Germans and everything German being our duty,

(8) ROADS.—The following resolution proposed by Mr. Boyd and seconded by Mr. Dennis was carried unanimously:—

"That this Association calls the attention of the Executive Engineer, Kadur District, to the bad state of the road between Lingudhully and Birur, and expresses a hope that this road will soon have metal put down, as the crops and manure of all Estates from Sumpigay Estate to Hospett are carted over it."

The Honorary Secretary was requesfed to write and ask the Executive Engineer, Kadur District, as to when the construction of the new road from Kulhuttypur to Hebbe would be taken in hand.

(9) COUNCIL OF MYSORE PLANTERS' ASSOCIATIONS.—A letter from the Assistant Scientific Officer for Mysore dated 15th October, 1915, was read, in which he expressed his regret at not being able to attend the meeting.

The following resolution proposed by Mr. Denne and seconded by Mr. Kerr was carried unanimously:—

"That in the event of the C. of M. P. A. allowing the A. S. O. to dispose of his horse, the amount realized by the sale of the horse, shall be refunded to the C. of M. P. A. in the event of the A. S. O. severing his connection with the Mysore Associations.

The horse allowance may be granted to him for the upkeep of his car, but this Association declines to pay the insurance Premium on the car."

10. REPORT OF DELEGATES TO U. P. A. S. I. MEETING.—The report was read by Mr. Boyd, and gave an interesting resume of matters that particulary interested us.

(11) PROPOSED LABOUR RULES.—A letter from the Honorary Secretary N.M.P.A, dated September 18th, 1915, was read, and the meeting came to the following decision, that the Honorary Secretary be requested to write to the North and South Mysore Planters' Associations, and inform them, that Mr. F. Hugonin and another member, had been elected as our representatives, and would be glad to meet their Delegate in Chickmaglur on a date to be mutually arranged amongst themselves.

(12) COFFEE STEALING.—The Honorary Secretary informed members, that he had forwarded the resolution carried at our last meeting to the Government of Mysore and had been informed, under date 3rd August, 1915, "That the resolution had been referred to the Chief Court for their consideration."

(13) ELECTION OF OFFICE-BEARERS—

President	...	Mr. A. B. Boyd.
Vice-President	...	Mr. C. Sylk.
Honorary Secretary	...	Mr. S. H. Dennis.

Mr. F. Hugonin was elected our representative on the Assistant Scientific Officer's Board of Control.

The meeting closed with a vote of thanks to the President and Honorary Secretary.

(Signed) A. B. BOYD,
Chairman.
(„) S. H. DENNIS,
Honorary Secretary.

FUTURE COMPETITION WITH GERMANY.

The current issue of the *Bulletin d'Encouragement pour l'Industrie nationale* (May-June, 1915, No. 3, Vol. 122) is of special interest, inasmuch as it gives the views of men, each eminent in his own particular sphere, on the reasons why much of French trade has been captured by Germans; and also their suggestions for preventing the commercial aggression of the Germans after the war. The bulletin begins with a short preface by the president, M. Leon Lindet; this is followed by suggestions by M. Niclousse to the following effect: (i) A statute is to be passed for stopping foreign, and especially German, individuals, companies, or products from masquerading as French. It is urged that all machines, apparatus, and products should be of French manufacture and, if possible, invented by a Frenchman. (ii) A circular to be issued by the Syndicate of Mechanicians, Boilermakers, and Foundrymen, urging the public to avoid purchasing anything of German or Austro-Hungarian manufacture, and to buy rather from the Allies. (iii) To prevent Frenchmen from acting as agents for the enemy. (iv) To employ no German means of transport.

Much of the French material was made in districts now occupied by Germany; it is sad to read that 95 per cent. of the steel made by the Gilchrist-Thomas process, 90 per cent. of the iron ore, 100 per cent. of steel tubes, 76·6 per cent. of rails, etc., formerly made in France, are now in German hands. On the other hand, iron alloys, cast-iron, spiegel-iron, iron coated with zinc, copper, and lead, have been little affected.

It is also hoped that duties will no longer be levied on raw materials; French manufacture has hitherto been handicapped by this.

The Syndicate of Pharmacy also suggests that French medical men be circularised, and that lists be furnished them of substances of German origin which should not be purchased. The Society of Lithographers, in its report, states that lithographic stones, previously obtained from Munich, may be replaced by plates of zinc and aluminium with advantage. Bronze leaves, and bronze, copper, and aluminium powders, it appears, have not been made in France; it is recommended that their manufacture be begun. The German success has been largely due to long credits; they sell machines, and by their banking system can afford to wait long for payment. Subsidised German transport gives German manufacturers a great advantage; it is often cheaper for a Frenchman to send his goods through Hamburg than directly from one part of France to another. A better French consular system is called for, as well as the revival of apprenticeship, and the more loyal co-operation of workmen.

Portland cement has not been troubled with German competition in France; but the machines are of German make. It appears that 80 per cent. of the cement works are in territory at present occupied by the German army.

Agricultural implements, though made to some extent in France, have largely been imported from the United States. It is suggested in this report that lending corporations, trusting repayment to the honour of the borrowers, would be of great service, and that they would rarely have loans out to defaulters.

Such are the reports on various industries. They all reprobate German methods as unfair, while giving credit to the Germans for great industry and power of organisation.

A long article follows by Prof. Henri Hauser, of Dijon, on "German Industry as a Factor in War." He attributes to the Germans the good qualities of regular, methodical work, and a sense of, or even a genius for, organisation. "It is the union of the laboratory and the factory which has created German wealth." "It is also to be remarked that there is a close link between the director's office and the library of the economist, the geographer, and the historian." "The German chemist and the German commercial traveller walk side by side to conquer the world." These and other similar aphorisms explain the astonishingly rapid growth of German industry.

Nothing is more eroneous than to describe Germany as an overpeopled country. Of the 67 million Germans, 17 millions are tillers of the soil: but every year peasants throng into the towns; there are above 45 towns or more than 100,000 inhabitants. Cereáls and meat have to be imported to feed 20 million Germans. Cotton is the largest import; its value is about 500 million marks, or 25 million pounds sterling. Germany requires much capital; new companies and ventures are continually being started; and owing to the system of credit, it may be said that she swallows capital before its birth. Companies with an imposing capital rest on the credit of industrial banks: these on Central banks; these again on the Deutsche Bank, which is guaranteed by the Reichsbank, that is, the credit of the whole German State. In order to pay for her imports, foreign trade is essential to Germany; she must sell her manufactured products. *This war is being waged to keep and to gain foreign commerce*, Konrad Honisch, the Social-Democrat, said: "It is the social interests of the proletariat, even more than any political considerations, which render the victory of Germany imperative." The industrial State is therefore condemned to participate in a "Welt-politik."

Prof. Hauser gives instances of "dumping;" *e. g.*, in 1900, iron wire cost in Germany 25 marks per 100 kilograms, and elsewhere 14 marks; in 1902, the Coke Syndicate forced the consumer to pay 15 marks a ton, while coke was sold abroad for 11 marks. But the gain exceeds the loss; the State-supported syndicate makes this possible. In the former instance there was a loss on foreign trade of 859,000 marks, but a gain on home trade of 1,117,000 marks,

The Germans form companies abroad, largely from foreign capital; but the majority of the directorate are Germans. For example, the *Banque des Chemins de Fer orientaux* of Zurich has a board of eight German directors, one Austrian, five Swiss, one French, and one Belgian. The ordinary shares are all held by Germans; the preference shares, with a lower rate of interest does not tempt German investors. In Italy a similar state of things exists. All large concerns, such as the Nord Deutscher Lloyd, the Hamburg-Amerika line, the Deutsche Bank, the Disconto-Gesellschaft, Siemens-Schuckert, Krupp, and Guison are subventioned by the Imperial Ministry of Foreign Affairs; furthermore they are helped by *a kind of industrial espionage*, as well as by guarantees and subsidies. "Germany was 'in a blue funk' about her commerce. What would become of Essen, of Gelsenkirchen, of all Westphalia, if the Roumanians, Greeks, and Serbs were to order their cannon, rails, or locomotives from Glasgow or Creusot? War appeared preferable to Germany than a huge commercial crash, and the iron had replaced the velvet glove." "Little by little the idea of a necessary war—a war almost to be wished for—became the desire of the working classes; failing it, they might starve, and their employers, the capitalists, be ruined." "After the

great war is over the commercial war will be on us again. We must prepare *now*.

To this essay there follow some interesting articles by M. Delloye, by M. Ernest Fourneau, director of the Laborary of Therapeutic Chemistry at the Pasteur Institute, M. Justin Dupont, Prof. Wahl of Nancy, M. Legouez, and M. Ribes-Christophle. Among other observations we note one stating that French manufacturers usually only keep pace with current demand for goods; when a period of prosperity sets in, he cannot supply the increased demand, and his customers are driven to buy German goods; for Germans have always reserve plant ready for an emergency. For this reason they are able to execute orders more quickly; what it takes three months to supply in France can be delivered from Germany in a fortnight. M. Fourneau gives much interesting information on German drug manufacture; he concludes: "You know that fraud and slimness pass in Germany for quasi-virtues.....Germany, after having tried to frighten its adversary by its terrifying appearance, knows well how to appear humble, insignificant, and invisible." M. Dupont directs attention to the enormous task before the Allies of overtaking the German colour manufacture, which has been elaborated during the past forty years. Drugs, dyes, and explosives are so interlaced that the by-products of one manufacture often serve as the raw material of the others. M. Ribes-Christophle treats of German commerce in Argentina. False labels for goods, and adulteration are common. German firms, too, supported by their banks, *i.e.*, by the Central Government, sell at first at a loss, until they have killed out competitors. Their banks, of which there are branches in Argentina, act as company-promoters.

The impression gained from these articles is that German trade is already fraudulent, sometimes honest, always methodical; that it is regarded as the duty of the State to support it by all means moral and immoral; and that France must take steps to exclude it if she is to retain her position as a manufacturing nation. What these steps are has not yet been indicated. We shall look forward with the utmost interest to their decision; but it should be one taken in concert with the Allies.—William Ramsay. —*Nature.*

Eight Months' Shipping, January—August.

The tonnage of vessels entered at ports in the United Kingdom from foreign countries and British possessions, *with cargoes*, during the eight months, January—August, 1915, amount to 22,541,664 tons, and the tonnage cleared to 26,822,007 tons, as against 31,243,189 tons entered, and 41,980,652 tons cleared, during the eight months, January—August, 1914. With regard to the coasting trade, the tonnage arrived *with cargoes* during the eight months, January—August, 1915, amounted to 19,111,982 tons, and the tonnage departed to 18,980,977 tons, as against 25,473,264 tons arrived, and 25,339,221 tons departed, during the corresponding period of 1914.—*Board of Trade Journal.*

Members of District Associations who have joined the Army.

Mundakayam Planters' Association.—Mr. R. J. Scarbrough (Kuppukayam Estate) has been appointed Captain in the 3rd Battalion Devons.

Lance Sergt. H. J. Byrne, H. L. I., (Yendayar Estate) was wounded in the right hand in the recent big battle in Mesopotamia.

CORRESPONDENCE.

Labour Department.

Westward Ho! High Ground,
Bangalore, S. India.
Camp Srivilliputtur, 29th October, 1915.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—In reply to "Tamil," whose letter appeared in your issue of 23rd October, I do not know any planter now in S. India who could pass a good test examination in the Tamil language. I certainly could not do so myself. Moonshis could be supplied, but they would demand very high salaries to go to planting districts, and it could hardly be made worth their while to teach only one pupil. It is quite posssible to learn any language from a phonograph, which could be hired at so much a month. The records are also hired out, and students are supplied with blank cylinders on which they reproduce their own attempts, which are posted to the teaching office from which they receive a letter which enables them to correct their mistakes. It sounds complicated, but I know a gentleman getting on in life who learnt Italian in this way and passed a very good examination. He got a special letter of congratulation from the Directors of the teaching Institute on his success. We must wait till we recover from the War before this idea can be carried out.

If "Tamil" or anyone else really wants to learn the language, he should begin with the alphabet. I have given the same advice to scores ofmen but only half-a-dozen took my advice, they all have a very good know-ledge of the language, and each is famous among his neighbours in this respect.

It is true a sort of Tamil generally considered sufficient to work an Estate can be picked up, and again I know half a dozen men who are really good colloquially and have learnt the language in this way. The vast majority talk a lingo which their own coolies learn to understand, and which the coolies also use in speaking to their masters. They are at sea with coolies on another Estate, or with coolies new to their own Estate. They begin by declaring they never saw such stupid people who don't even know their own language, and afterwards boast of the wonderful improvement in the coolies after they had been licked into shape. The real fact being that all coolies are quick at picking up the language of their Masters, but it can hardly be cailed Tamil when everything is third person singular neuter.

Let "Tamil" spend one hour a day at the Tamil alphabet till he can't be puzzled at it. It has 18 consonants and 12 vowels with their resulting combinations = 216 characters, plus a few Sanskrit letters. Any Tamil Writer is good enough to teach him the correct value and sound of each combination. He must not think because he never hears these sounds from his coolies that therefore he is being taught wrong. When he finds that the Tamil equivalent for the two lettered English word "is" consists of five syllables, or that the word for "dawn" is given to him as "Kolikuppi-dugiraneram" he must not consider that the Writer is a fool. If he thinks so, the converse is more likely to be the case. Let him humbly learn as an infant learns his primer at school. By and by it will be time enough to understand how the cooly arrives at his pronunciation of his own language. It is not so far from the correct thing as the language spoken by Yorkshire and Devonshire people of the same class, is from English, while every Tamil cooly will always understand correctly spoken Tamil. If "Tamil" will communicate with me direct, I may be able to help him further.

Yours faithfully—AYLMER Ff. MARTIN.

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	19,893	0	0
Mr. Stephen Bayley	20	0	0
Mr. L. P. Kent	100	0	0
Mr. E. H. Halliley	20	0	0
Mr. J. Stuart	150	0	0
South Travancore Planters' Association ...	176	0	0
Total Rs...	20,359	0	0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed	2,502	8	0
Mr. H. S. K. Morrell	40	0	0
Mr. J. A. Anderson, Assistants, Conductors and Coolies of Lahai Group Estate	665	6	0
Total Rs...	3,207	14	0

Members of District Associations who have joined the Army.

WYNAAD PLANTERS' ASSOCIATION.—Lieut. G. R. R. Carson Parker, R. F. A. died of wounds in Flanders.

He was employed by the Panora Tea and Produce Company, Ltd. as Superintendent of Erramaculla Estate and was one of the two first in this District to leave for the purpose of joining the Army, just over a year ago. This Association is honoured by having been able to count him as one of its members.

CENTRAL TRAVANCORE PLANTERS' ASSOCIATION—

Killed ... ... F. W. Lowder.
Wounded ... ... W. W. Moser and G. P. Farley.

The death of Mr. Lowder is much regretted. He was one of the first to leave on the outbreak of War.

INDIAN TEA.

About 35,300 packages have been offered during the week. Some 2,400 packages were withdrawn, but generally there was good competition for all, but the finest tippy kinds. The increase in the duty has stiffened the market for common sorts. Teas costing over 1s. were irregular and often easier. No really fine Darjeelings have been offered, but medium grades, with useful liquors, were readily taken. For next week 43,000 packages are catalogued. In Calcutta 25,000 packages were printed. The quality was rather below the average and the lower grades attracted most attention.

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended September 25 ...	4,753,983	5,161,822	2,434,845	1,590,843
For 39 weeks ended September 25 ...	216,865,228	223,681,859	40,061,594	40,928,053

—*The Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 46.] NOVEMBER 13, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

The Scientific Officer left on tour on the 10th and may not reurn for a month, but all correspondence and telegrams will be forwarded to him without delay.

The Director of the Labour Department is still detained at Srivilliputtur and will not return till about the 1st proximo.

The Chairman wishes it to be known that £200 has been cabled to Mr. McFarlane, Secretary and Treasurer of the South India Planters' War Fund to relieve immediate necessities, and he also expresses a wish that all District Associations would kindly inform all planters from their Districts at the front, when possible, that in case of need they should apply to Mr. McFarlane, 14, Billiter Street, London, E. C. In connection with this, for the information of a correspondent, we may state that a circular letter has been posted to the above effect to every known planter serving with His Majesty's Forces with the various Expeditionary Forces. It is too much to hope that all these circulars will reach their destination, still it is hoped that a few will do so, and be passed on from one to another till eventually we shall get in touch with everyone.

We extract from a letter written to us by Mr. H. P. Hodgson, our late Chairman and Planting member, the following generous offer "We shall be glad to receive in our house any South India Planter who may come home either wounded or on leave and to look after him as long as required" for which offer the Chairman in the name of the U. P. A. has returned grateful thanks.

From the Wynaad Planters' Association comes the following and we can only hope that the ladies of the other Planting Districts will follow the meritorious and successful example set. "*Planters' War Fund*: Enclosed please find cheque for Rs 200 being proceeds of a jumble sale organised for this cause by Miss Winterbotham and the ladies of the District who desire to express their thanks to Messrs. Spencer & Co., Ltd., Wrenn, Bennett & Co., Ltd., and Higginbothams, Ltd., and friends for their contributions."

"Imitation is the sincerest form of flattery" and it is not given to us all to be orginal, but that the bright and shining example set by these ladies will be followed by the ladies of the other Districts, we have no doubt, leading to a substantial swelling of our totals.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Red Spider.

This pest is a serious one on many Tea Estates in Southern India and, in addition to the actual damage it does to the bushes by its direct attack and sucking the juices from the leaf, it appears to leave the attacked bushes in a weak condition so that they are readily attacked, after the Spider has disappeared, by other pests such as Scale Insects and fungoid diseases.

Sulphur is the recognised remedy for this pest and despite its undesirability, on account of its being liable to taint the made Tea for some time after its application in the field, there seems to be no other insecticide equally efficacious.

A planter who has been troubled with Red Spider on his estate (not Tea in this case) near Bangalore has been good enough to send me some notes of his experience in combating it for publication.

When first asked to advise on a remedy I recommended the usual mixture of flour paste and Sulphur made as follows :—

Stock Solution.—Cheap wheat flour is mixed with cold water at the rate of 1 lb. of flour to 1 gallon of water and boiled to a paste.

Sulphur-Flour Paste Spray.—8 gallons of the stock flour paste are added to 100 gallons of water and 15 lbs. Flowers of Sulphur are added and stirred in.

This mixture is applied as a spray in the early morning, the decomposition of the sulphur under the action of sunlight being the active principle.

This is the treatment recommended by the Imperial Entomologist for Red Spider and it was found to be quite efficacious.

Owing to the War the price of European Flour went up and a substitute was searched for. Cheap rice was first experimented with at 8½ seers per rupee, but it was found very difficult to get the cooly to make a paste with this free from lumps, minute particles of boiled rice, which combined with the sulphur and clogged the spraying nozzle. It may here be stated that the advantage of flour paste is that it acts as a good spreader for the sulphur enabling it to be put on so that the surface of the leaves are coated with the latter.

Finally Imperial Insecticide Bar Soap was substituted for flour paste. This costs in Calcutta 2 annas per lb. and delivery charges to Bangalore bring the cost to 2½ annas per lb. 2 lbs. of this soap and 3 lbs. Flowers of Sulphur in 40 gallons of water make an efficient mixture, killing the greater portion of the pest in 48 hours. The bar soap is dissolved in 4 gallons of water and the sulphur added and the mixture made up to 40 gallons. If the stock mixture is allowed to stand over night it settles into a thin jelly, but if reboiled and added to 40 gallons water it will pass the sprayer. To make the mixture even more efficacious one bottle of brown kerosine oil has often been added to the soap solution while hot.

My correspondent remarks that he has found by experience that this mixture adheres to the foliage and branches to a much better degree if the cooly can be taught to direct the nozzle of the sprayer in such a way that the spray alights as a spray, and does not use it as a sort of washing jet by sticking the nozzle right up into the bush. In the latter case the greater part of the liquid runs off immediately carrying the Sulphur grains with it

This can be seen by the deposit of the latter at the points and edges of the leaves after they have dried.

In dealing with Red Spider It is important to bear in mind that it attacks a large number of other plants besides Tea, and it might be present on other hosts in ravines and on the boundaries of the estate. Such host plants should be searched for and destroyed or sprayed. It is a common pest on Cholum for instance, and my Bangalore correspondent has found the source of infection on his estate to be neighbouring Castor cultivation and a wild scrub bush called *Çipadessa fruticosa*, Blume (*Meliaceae*). Brandis gives the vernacular names of this shrub as—Canarese—*Chitundi* and Tamil *Pulipan*. It also occurs on a creeper which has not yet been identified botanically.

I may add to these notes that in spraying for Red Spider it is important that the whole bush should be thoroughly saturated with the spray fluid. None of the sprays mentioned will kill the eggs of the Mite so that two sprayings are necessary at intervals of four to seven days.

Potash in Hevea.

At the last Annual Meeting of the U. P. A. S. I. a question was asked as to the amount of Potash in Hevea leaves and wood. The following analytical data are quoted by the *India Rubber World* (LIII. 1): —

POTASH IN HEVEA.

	Ash %	Potash % in Ash.
Bark	10·6	0·2
Leaves	4·4	25·8
Old leaves	4·4	4·7
Wood	6·0	13·5
Seed Husk	1·6	0·31 (on sample.)
Latex	0·35	43·0
Crepe	0·4	23·4
Biscuit	0·4	26·4

Nitrolim in Norway.

The *Consular Report* on the trade of Norway for the year 1913 contains the following note on the Nitrolim industry.

The principal factories at Odda were engaged in carrying out extensions during the year. The annual capacity of the North Western cyanamide factory, which has again changed hands and is now owned by a British firm, the Nitrogen Products and Carbide Co., was raised to 80,000 tons. The actual output was 20,284 metric tons of which 3,667 metric tons were sent to the United Kingdom. About one half of this is destined to be converted into nitrogen manure and one quarter into nitric acid. 799 tons went to British Colonies.

The electric power used is taken from the Tysse Waterfall Co. Its total electrical capacity, including reserves, is 86,340 horse power of which 56,000 horse power is supplied to carbide and cyanamide factories. The total capacity in 1915 will be 129,840 horse power when the power at Tyssedal is fully harnessed and to this must be added an eventual utilisation of the power at Skjaeggedal.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Central Travancore Planters' Association.

Proceedings of the Third Quarterly General Meeting of this Association held at the Travellers' Bungalow, Peermade, on Saturday, 23rd October, 1915, at 10 a.m.

PRESENT.—Messrs. H. C. Westaway (Chairman), W. H. G. Leahy (Vice-Chairman), J. A. Richardson, F. Bissett, J. S. Wilkie, C. A. Mackenzie, J. M. Wilkie, W. A. J. Milner, A. R. St. George, F. W. Winterbotham, A. T. Atkins, Dr. W. Mowat (*Visitor*) and R. P. Roissier (Honorary Secretary).

The Chairman: Gentlemen,—Since our last meeting we have to record the sad news of the death, at home, of an old and greatly respected Peermade Planter, I refer to Mr. W. Graham. I feel sure that you will all wish, with me, to express your deepest sympathy with Mrs. Graham in her great loss.

Also two Members of this District, Mr. Murray Thompson and Mr. Lowder have lately been killed in action. Mr. Lowder was one of the first to leave for the front on the outbreak of the war and we extend our greatest sympathy with the relations of these two brother planters.

Passed in silence, all members standing.

The Notice calling the meeting was read.

The Proceedings of the last Meeting were taken as read and confirmed.

CORRESPONDENCE.—All correspondence since the previous Meeting was read.

TEA THEFTS COMMITTEE.—Read letters from Mr. M. M. Knight and and Mr. McArthur on this subject and the Honorary Secretary was instructed to write to Mr. McArthur and ask him to serve on this Committee or to elect a representative from his Company.

The Committee as previously proposed was found to be too large. It was therefore proposed by Mr. J. S. Wilkie that the Committee consist of the following :—

A representative of the Travancore Tea Estates Coy., Ltd,

A representative of the Wallardie Tea Coy., Ltd.

W. H. G. Leahy, Esq.

C. A. Mackenzie, Esq.

H. B. Kirk, Esq.

Seconded by Mr. Richardson.—*Carried.*

It is hoped that these gentlemen will consent to serve on the Committee. It was also decided that the Committee elect its own Honorary Secretary.

Read letters from the Honorary Secretary, Mundakayam Planters' Association dealing with the proposed inter-district Labour Rules for Peermade and Mundakayam. This matter was discussed and it was resolved :

"That the Honorary Secretary do write to the Honorary Secretary of the Mundakayam Planters' Association and inform him that several of the Mundakayam rules do not fit in with those of this Association and in view

of the fact that there are very few cases for dispute between the two districts we do not see the necessity for Inter-District Labour Rules."

Read letter from the Honorary Secretary, Mundakayam Planters' Association regarding the registration of vehicles.

It was proposed by Mr. Leahy:—"That Mr. Richardson be asked to ascertain if there is any possibility of Government meeting the request of the Mundakayam Planters' Association in this matter of the registration of vehicles."

Seconded by Mr. Winterbotham.— *Carried.*

Read letter from the Madura Coy., Ltd. regarding Motor Tug Service on the Backwaters and after discussion it was thought by the Meeting that this was a matter for individual settlement.

Read Circular letter from the Secretary, U. P. A. S. I. with particulars of the Peoples Park Fair and the Association decided to support the movement and members were asked to send samples of Tea.

Read letter from Mr. Richardson regarding the Storage of fertilisers at Kottayam.

Proposed by Mr. Richardson: "That the Honorary Secretary do write to the Mundakayam Association and ask them to support this Association in the event of action being taken at Kottayam against our Agents for storing Chemical Fertilisers. Also this Association are prepared to meet legal expenses up to the sum of Rs.50 if the Mundakayam Association will supply a similar amount."

Seconded by Mr. Milner.—*Carried.*

Forest Regulation in Travancore.—It was resolved from the Chair: "That in view of the new ruling under the Forest Regulations demanding Timber value for forest land in addition to the land value, that this Association strongly protests against the present ruling demanding timber value in addition to ground value for Forest Lands in Travancore as this will shut down all possibility of planting extensions in the future and that Government be asked to revert to the old Coffee Land Rules. Also that the Combined Travancore Association be asked to take the matter up and appoint a deputation to wait on the Dewan with reference to this."

Election of Delegates for the Combined Travancore Planters' Meeting.—Proposed by Mr. Wilkie: "That Mr. Richardson and Mr. Bissett represent this Association." Seconded by Mr. Westaway. —*Carried.*

The Honorary Secretary was instructed to write to the Secretary, U. P. A. S. I. forwarding Messrs. Charles Hope's Tea Circular and to draw attention to recent sales of Java Tea. This to be also sent to the Indian Tea Association.

Bangalore Delegate's Report.—I attended as your Delegate the 22nd Annual General Meeting of the U. P. A. S. I. held at Bangalore from the 16th to the 19th August, 1915.

There were present, besides the Executive, 20 Delegates, representing 12 districts.

A summary of the Proceedings of the Conference appeared in the

"Madras Mail" and other papers, giving all who are interested an idea of what was done, so I will only touch on those matters of interest to this Association.

COCHIN HARBOUR.—I spoke to the following resolution: "That this Association is strongly in favour of the construction of a Harbour at Cochin, which would be open throughout the year, and that Government be asked to continue dredging operations at once, so that the feasibility or otherwise of the Improvement Scheme, may be definitely settled at an early date." The resolution was seconded by the Kanan Devan Delegate and carried unanimously.

VAIGAY VALLEY RAILWAY.—This was brought up by the Kanan Devan Delegate and seconded by me.

TEA THEFTS ACT.—It was the opinion of the meeting that there was no prospect of our getting the Act, so the matter was shelved.

FREIGHTS.—The following resolution was adopted after some discussion. "That this meeting take every possible step to secure a reduction of, and more regular freights for tea, coffee, and rubber, and other products from S. India, especially invoking the assistance of the Chambers of Commerce in Madras, Tuticorin, East and West Coast ports."

SCIENTIFIC DEPARTMENT.—The new Scientific Department Scheme was discussed, and the Delegates at the meeting were unanimous in their opinion that the generous offer of the Madras Government be accepted. It was thought prudent that a guarantee fund be started, in case there should be a falling off in subscriptions and planters were asked to guarantee Rs.150 each in any one year. The guarantors will not be called upon, unless the working profit of the U. P. A. S. I. falls below Rs.500. Rs.2,300 was guaranteed at the meeting, and Delegates were asked to try and obtain guarantors from among members of the Association. I would ask our Honorary Secretary to circulate a notice, and appeal to members to become guarantors.

Government will take over and work the Scientific Department, but there is no chance of getting a Mycologist till after the war, and little chance of the Department being organised till then.

AGRICULTURAL MATTERS.—Mr. Anstead gave us a most interesting lecture on Manure and proved conclusively with the assistance of the Blackboard that it would pay planters to purchase the best fish guano, against the usual milled fish we now get. The representatives of coast firms present were asked to guarantee that their fish manure contain no more than a certain percentage of sand, but this for various reasons they were unable to do.

ARTIFICIAL MANURES.—From conversations I had with the representatives of Manure firms, I gather that the only manure to be seriously affected by the war is Potash, but that an efficient substitute has been found in Nitrate of Potash, an Indian production.

PLANTING EXPERT.—I asked Mr. Anstead to pay the District a visit, during the course of his present tour, and he hoped to do so, during November.

LABOUR DEPARTMENT.—A copy of Mr. Martin's very satisfactory report is now in your hands, from which yon will see the good work that has been done during the first year.

I was requested by Mr. Leahy to ask Mr. Martin for an explanation of his remark at the Extraordinary General Meeting of the U. P. A. S. I. held

in 1914, when the working of the Labour Department was discussed. The words Mr. Leahy took exception to, read somewhat as follows : " We would have to decide how to deal with black sheep, and estates who were not subscriberes to the Labour Department." Mr. Martin explained that he referred to black sheep within the fold and that we would undoubtedly have to decide on a line of action with regard to non-subscribing Estates, but that no hostility was intended to the latter.

PLANTERS' WAR FUND.—A Planters' War Fund was started on the last day of the meeting known as the " South India Planters' War Fund " to assist planters who had joined His Majesty's Forces, and was to include emp'oyees of Mercantile Firms belonging to District Associations. Rs.10,860 was promised by delegates at the meeting. An Aeroplane Fund in co-operation with the Overseas Club was also started and I hope that when the list comes round all members of this Association will subscribe liberally.

Mr. C. H. Browne (North Mysore) was elected Chairman with Messrs. Waddington and Nicolls as Vice-Chairmen, and Mr. Richardson as a member of the Central Control Committee of the Labour Department.

This, gentlemen, ends by report, and if there are any questions that the meeting would like to ask I shall do my best to answer.

(Signed) F. W. WINTERBOTHAM
Ladrum Estate.

The Chairman thanked Mr. Winterbotham for so ably representing us and for his interesting Report. (Applause).

ELECTION OF SRIMULLAM DELEGATE.—Mr. Leahy proposed : " That Mr. Milner represent this Association at the forthcoming Srimullam Assembly," Seconded by Mr. Roissier.—*Carried.*

Mr. Milner thanked the members for electing him as their Delegate.

WAR FUNDS.—The Chairman appealed to the Members to support liberally the Funds, details of which they now had before them.

Mr. Richardson addressing the Meeting said :—

GENTLEMEN.—The Planters' War Fund requires no recommendation from me. It was started at our last Bangalore Meeting by Mr. Murphy who made a most eloquent appeal and met with unanimous support. I cannot hope to express myself as Mr. Murphy did but you have no doubt all read his speech which stirred the whole meeting and resulted in over Rs.11,280 being raised in the room.

I want to awaken that influence and ask you to subscribe to this Fund to the utmost of your resources and at the same time to remember that it need not be a lump sum down but can be spread over a stated time or for the period of the war.

The Fund according to the latest *Chronicle* has reached Rs,15,790 and I hope to see this doubled before the end of the year and I know Peermade will do its share.

We have all been subscribing to various funds but this particular one has a very special call on us. It is to help the 140 odd brother planters from Southern India who have given up their billets to go and fight for the King and Country and who knows that many of us in this room may not be called on to do the same before this terrible struggle is over.

Some have already gone never to return and since we last met we have had news of the death of Mr. Lowder, one of the first to go from this District; whose death we mourn and whose memory we honour.

Many at the present moment may be lying seriously wounded and perhaps maimed for life and surely it is up to us who have stayed behind to help them and those dependent on them.

I want to see a record sum sent in from Peermade and the list sent round to all those in the District who do not happen to be members of this Association.

Monthly or quarterly subscriptions can be given. We have something to go on with at present but the Fund will be taxed to its utmost before this awful war is over.

With these few words, Gentlemen, I leave it to your generosity to see that Peermade does its share.

The following amounts were promised in the room :—

South India Planters' War Fund :

Donations	...	Rs. 600
Per mensem till end of the War...	...	„ 105
Instalments	...	„ 400

It is hoped to still increase this amount as some Members were not present at the Meeting.

RESOLUTION BY MR. MILNER.—This was left to be dealt with by the Tea Thefts Committee.

TEA THEFTS.—The Honorary Secretary was instructed to write to the Commissioner of Police, Trivandrum, recording our appreciation for the way in which the Sub-Inspector of Police, Kottayam, has brought the recent Mai Mallay Tea Thefts case to a successful conviction.

With a vote of thanks to the Chair, the Meeting terminated.

(Signed) REGINALD P. ROISSIER.
Honorary Secretary.

Kanan Devan Planters' Association.

Proceedings of the Bi-Annual General Meeting of the above Association, held in the High Range Club, Munnar, on Saturday, October 30th, at 2 p.m.

PRESENT.—Messrs. C. Fraser (in the Chair), A. J. Wright (Vice-Chairman), G. E. Bewley, A. Yates, J. S. B. Wallace, A. Blair Hill, G. W. Cole, E. H. Francis, W. Fraser, H. L. Pinches, R. T. Landale, A. G. Murray, W. A. Lee, A. W. L. Vernede, W. O. Milne, Dr. J. S. Nicolson and G. A. Holden, (Acting Honorary Secretary). *Visitors*—Revd. W. Bateman and E. L. Koechlin, Esq.

Before commencing the proceedings of the meeting the Chairman said that it was with very deep regret that he asked those present to pass a vote of condolence with the relatives and friends of the late Mr. C. E. L. Ward who has worked so worthily on our behalf as our representative on the Labour Department staff. The vote was passed in silence, members standing.

The notice calling the meeting having been read, the minutes of the Annual General Meeting having been printed and circulated, were taken as read and confirmed.

SRI MULAM DELEGATE.—The Chairman proposed that Mr. A. J. Wright who had so ably represented them previously should be again asked to attend the Sri Mulam Assembly as their representative, this was agreed to unanimously. Mr. Wright thanked the meetiug for the honour they had done him and promised to forward their interests to the best of his ability.

DISTRICT MUNSIFF'S PECUNIARY JURISDICTION.—The reply of the Chief Secretary to Travancore Government to the representation put forward by the Sri Mulam delegate at the 11th session of the Assembly requestng that the District Munsiff's pecuniary jurisdiction be raised to Rs.5,000, was put before the meeting, which decided that the increase should be pressed for, no reasons against it being stated in the letter.

SUBJECTS FOR DISCUSSION AT SRI MULAM ASSEMBLY.—The Chairman asked the meeting to propose any subjects for discussion at the next Sri Mulam Assembly; as none were put forward, he asked the meeting to permit the Committee to decide on the subjects at their next meeting, which was agreed to unanimously.

BANGALORE DELEGATE'S REPORT.—Mr. A. J. Wright read the report of the Bangalore Delegates; the Chairman proposed a hearty vote of thanks to the Delegates who so ably represented us, which was passed unanimously.

CORRESPONDENCE—

(*a*) POST OFFICES.—Letter No. 702 from the Postmaster-General, Madras, was read, from which it was noted that the request for a postal service between Udumalpet and Talliar could not be acceded to.

(*b*) ROADS.—The meeting noted with approval that the request for extra grant for the upkeep of the Mettu Ghat Road was being enquired into.

(*c*) The Acting Honorary Secretary read Messrs. James Finlay & Co.'s letter with reference to Mr. Abbott's resolution passed at the Annual General Meeting, the Chairman proposed a vote of thanks to Messrs. James Finlay & Co., for their sanction in allowing the Secretary to advise members of the Association of changes of rates of pay, advances, &c., to coolies, which may be decided on from time to time.—*Carried unanimously.*

(*d*) Contents of letter, *re* People's Park Fair and Exhibition was explained by the Chairman and the meeting decided to support the Exhibition, the Acting Honorary Secretary was requested by the meeting to obtain further particulars and circulate the members.

OVERSEAS AIRCRAFT FUND, S. I. P. B. FUND AND WAR FUND.—The Chairman remarked that he hoped the meeting would subscribe to these Funds, particularly the two latter, which were deserving of the greatest support possible; a subscription list was then circulated and a considerable amount was promised to the funds, the Chairman thanked those present for their generosity.

EXPENSES TO BANGALORE DELEGATES.—The Meeting agreed that the usual expenses should be allowed.

A vote of thanks to the Chair terminated the proceedings.

(Signed) C. FRASER
Chairman.

(„) G. A. HOLDEN,
Ag. Hony. Secretary.

COFFEE.

The Cultivation and Preparation of Coffee.

AN INTERESTING REVIEW OF THE SUBJECT OF CULTIVATION, PREPARATION AND CONSUMPTION OF COFFEE.

At the present day coffee is cultivated in most tropical regions of the world, and to some extent also in certain sub-tropical countries. The importance of the industry may be judged from the fact that the value of the world's annual production of coffee is about £60,000,000. Considerable interest is being taken in the crop in many British tropical possessions which have not hitherto participated in the trade to any extent, and the present article has been prepared with a view to providing those who contemplate growing the crop with a brief outline of the cultivation of the plant and the preparation of its product.

THE PRODUCTION OF COFFEE.

Coffee first come to be used to any extent in western Europe about the middle of the 17th century, the produce coming at that time from Arabia. Once the value of the crop became known, its cultivation spread rapidly in many tropical regions, the West Indies and Java becoming successively the chief centres of production. Later Brazil took the first place in the output of coffee, and at the present time over three-quarters of the world's production is grown in that country. The present position of British possessions in relation to other producing countries may be seen from the following table, which shows the exports of coffee from the chief coffee-growing countries of the world in the last year for which statistics are available.

Exporting country.	Year.	Quantity. Cwts.	Value. £.
BRITISH POSSESSIONS—			
India ...	1914	356,905	1,384,242
Jamaica ...	1912	89,586	274,731
Federated Malay States ...	1913	14,486	25,437
Uganda ...	1913-14	12,252	23,167
East Africa Protectorate ...	1912-13	3,032	11,071
Queensland (1) ...	1912-13	1,178	4,947
Nyasaland ...	1913-14	1,721	4,802
British Guiana ...	1913	798	2,318
Ceylon ...	1913	187	612
Sierra Leone ...	1913	152	598
FOREIGN COUNTRIES—			
Brazil ...	1912	14,263,386	46,558,000
Venezuela ...	1912-13	1,197,708	3,440,865
Porto Rico ...	1913	...	1,773,190
Guatemala ...	1909	...	1,763,255
Java and Madura ...	1913	567,060	...
Hayti ...	1913	514,231	...
Mexico ...	1911-12	479,862	1,382,993
Salvador ...	1912	...	1,381,460
Colombia ...	1911	367,000	...
Costa Rica ...	1913	256,196	741,890
Nicaragua ...	1913	236,200	...
Angola ...	1913	96,062	...
Arabia (2) ...	1909	92,300	282,725
Ecuador ...	1910	77,490	153,592

Experting country.		Year.	Quantity. Cwts.	Value. £.
FOREIGN COUNTRIES—				
Hawaii	...	1913	26,133	102,684
German East Africa	...	1912	30,880	95,168
Guadeloupe	...	1912	18,728	90,065
Abyssinia (3)	...	1913	93,770	68,507
Dominican Republican	...	1913	20,641	51,415
Liberia	...	1912	13,520	47,456
Madagascar	...	1913	...	33,181
Sumatra (East Coast)	...	1912	10,540	...
Honduras	...	1912-13	...	17,135

(1) Figures of Production.

(2) Consular district of Hodeidah.

(3) Consular districts of Harrar and Gambela.

CONSUMPTION OF COFFEE.

By far the most important consuming country is the United States, which takes about two-fifths of the total world's production, Germany following next in order, absorbing about one-sixth of the total, and then France, Austria-Hungary, Netherlands, Belgium and Sweden. So far as consumption per head of population is concerned, the Netherlands, Sweden, Norway, and Belgium are the most important countries, the United Kingdom occupying a very low place among European countries in this respect. This country imports considerable quantities of raw coffee, as well as much smaller amounts of roasted and ground coffee, but most of it is re-exported; the total quantities and values of the coffee imported during the last three years, and the amounts entered for consumption, are as follows:—

		Imports.		Entered for consumption.
		Cwts.	£	Cwts.
1912	...	673,982	2,518,521	259,551.
1913	...	846,918	2,923,083	260,396.
1914	...	1,036,939	3,580,093	269,043.

The consumption per head in the United Kingdom has decreased from 1·02 lbs. in 1866 to 0·65 lb. in 1910, but during this period there has been a corresponding increase in the consumption of tea from 3·42 lbs. to 6·39 lbs. per head. Practically every other European country, on the other hand, had increased its consumption of coffee in recent years, more particularly Germany, Spain, Denmark, France, Sweden and Russia.

The estimated consumption of coffee per head in some of the chief countries of the world in 1909 was as follows:—

		Pound.			Pound.
Netherlands	...	15·3	Austria-Hungary	...	2·6
Sweden	...	13·1	Italy	...	1·6
Norway	...	12·6	Greece	...	1·6
Belgium	...	12·3	Spain	...	1·4
United States	...	11·5	Turkey	...	1·4
Denmark	...	9·3	Portugal	...	1·3
Switzerland	...	7·5	Canada	...	1·1
Germany	...	7·5	United Kingdom	...	0·67
Cape Province	...	7·0	Australia	...	0·53
Orange Free State	...	6·8	Natal	...	0·35
France	...	6·0	Russia	...	0·24
Transvaal	...	3·5	New Zealand	...	0·23

Species and Varieties of Coffee.

Coffee belongs to the genus *Coffea* (natural order, Rubiaceae), which includes about 40 species, native to the tropics of the old world, chiefly Africa. Of these comparatively few are of value as a source of coffee, the two most important being *C. arabica*, L., the Arabian coffee. and *C. liberica*, Hiern, the Liberian coffee. The chief characters of these and some others which have been introduced into cultivation are dealt with below.

Coffea arabica, L.—This plant is now usually regarded as native to the Mountains of Abyssinia, when it was introduced to Arabia in early Mohammedan times. It is at the present time by far the most widely cultivated species, and occurs in many varieties and forms, the true Arabian or Mocca coffee being usually regarded as the type.

Co. arabica is an evergreen shrub which, when allowed to grow naturally, reaches a height of 15 to 18 feet. It has a central tap root bearing lateral branches, many of which are quite near the surface of the soil. The sessile, pointed leaves are arranged in pairs on the slender, slightly drooping branches, and are 3 to 4 inches in length. The flower buds are formed in clusters in the axils of the leaves. The white, fragrant flowers are open for only a short time, varying from 12 to 36 hours. The ripe fruits or "cherries" are dark crimson in colour, slightly elongated, and circular in cross section. In the case of the Ceylon variety they are about $\frac{3}{4}$ inch long and a little over $\frac{1}{2}$ inch in diameter. The outer part consists of fleshy pulp, like a cherry, and inside are two seeds surrounded by a hard, dry husk, known as the "parchment." The seeds develop in close contact with one another so that one side becomes flat; occasionally, however, only one seed comes to maturity, which then becomes spherical and forms the "peaberry" coffee of commerce. Between each seed and the parchment is a tin pellicle known as the "silver-skin."

Numerous varieties of *C. arabica* have been described, but in most countris the various races have never been studied systematically, and it is impossible to give anything like a complete account of all those in cultivation. Jumelle (*Les Cultures Coloniales: Plantes alimentaires*, 1901, p. 352) enumerates the following forms in additios to the true Arabian or Mocca coffee, but some of these must be regarded rather as geographical groups, each comprising a number of distinct varieties, than as true varieties.

1. "Vermelho."—A red-fruited coffee much grown in Central America; it is more robust than the type.

2. "Amarello."—A yellow-fruited form with a rather bitter taste, known in Brazil as "Botucatu"

3. "Maragogipe."—A verry vigorous type which produces seeds almost as large as Liberian coffee and of excellent quality. It is grown to a small extent in Brazil, and has been introduced into South India. It is sometimes regarded as a hybrid between *C. arabica* and *C. Laurentii.*

4. "Leucocarpa,"—A white-fruited plant found originally in Sierra Leone. Watt has called attention to the fact that this form may possibly be a special species of that country and not a cultivated race of *C. arabica.*

5. "Soufriere."—A very hardy plant that resists insect pests. It produces seeds much larger than those of the type.

6. "LEROY OF REUNION" OR "POINTED BOURBON."—This is hardier than the type; it has short branches crowded with leaves and the seeds are pointed at one end.

7. "MYSORE."—The branches are ascending and the seeds round and heavy, but the yield is irregular.

8. "COORG."—This has large, flat seeds.

9. "JAVA."—The branches in this case are less horizontal than the type.

According to Mission, the chief forms grown in the State of Sao Paulo, Brazil, in order of importance, are "national" or common coffee which occupies about three-quarters of the plantations; "Bourbon" which occupies about one-fifth of the plantations; "Botucatu," "Maragogipe," "Java" and "Murta," the last-named being regarded as a degenerate form of "Bourbon."

Four races of *C. arabica* are recognised under cultivation in Yemen, the principal coffee-growing region of Arabia: (1) "Matari," which produces a small seed and is cultivated in the district between Menakha and Souk-el-Khemis at an altitude of about 6,000 feet; this yields the finest Arabian coffee; (2) "Haini," which much resembles the preceding, but yields a larger seed; (3) "Cheresi" and (4) "Cohlani." The last two produce coffee of very good quality, but inferior to that of "Matari" (*L'Agric. Brat de Pays Chauds*, 1912, 12, ii, 331).

A number of varieties occur in Abyssinia, which fall into two classes (1) "Harrari," the finest Abyssinian coffee, which is grown in Harrar and Tchertcher at an altitude on 5,000 to 6,000 feet, and (2) "Abyssinian," which occurs chiefly in Ilou-Babor, Sidamo, Goffa and Ouallaga.

The varieties of *C. arabica* grown in Java have been carefully studied by Cramer, who distinguishes 15 kinds (*Med. Dep. Landb.*, No. 11, 1913, Batavia). These he arranges under the following headings:—

(1) *C. arabica typica.*

(2) Varieties with small leaves: *Mocca laurina* ("Bourbon"), *Murta*, *monosperma* and *polysperma.*

(3) Varieties characterised by the colour of the fruits: *purpurascens* ("Orange coffee") *amarella* ("golden-drop coffee"), *variegata*, *bullata* ("Djamboe coffee"), and *angustifolia.*

(4) Varieties with characteristic growth-form: *erecta* and *penduls.*

(5) Varieties with vigorous growth: *Maragogipe* and *columnaris.*

Coffea liberica, (Bull) Hiern.—This species is found wild along the West coast of Africa from Sierra Leone to Angola, and has been introduced into many other parts of the world in the hope that it would prove more resistant to disesase than *C. arabica.* These hopes, however, have not been altogether realised, although it has proved to be more robust than the latter species, and, generally speaking, grows better at low elevations. Its cultivation has made most headway in the Dutch East Indies, where much work has been done on its improvement. There is little prospect, however, of much extension in its cultivation, except in certain regions less suited to *C. arabica*, as the product is generally regarded as inferior to Arabian coffee.—*Simmons' Spice Mill.*

(To be continued).

CORRESPONDENCE.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—I notice that your correspondent "Tamil" in your issue of the 23rd October writing with reference to the subject of vernacular instruction uses the expression that though others know not how to teach *the Munshi does.*

Having been compelled to pass what the Government of Madras seems to consider a "good test" in a certain vernacular of the Presidency, I have had recourse to the services of various munshis so-called. I venture to assert that I have gained by the bitter experience of failure at the examinations themselves the knowledge that the munshi does not attain to that high standard of didactic ability claimed for him by the generous "Tamil," and should that gentleman discover a munshi who can teach he would do well to hold on to him as fast as any limpet to a rock, for he is "a rare bird on the earth" and shares that distinction with the "black swan" of the poet.

Yours faithfully, DISILLUSIONED.

TEA,

INDIAN TEA.—At auction 32,649 packages have been offered. Owing to the unsettled state of the market, prices were somewhat irregular for the better grades, and Teas costing over a shilling were generally lower. Common kinds were firm and became dearer as the week advanced. Finest Assams were neglected, but the few flavoury Darjeelings catalogues fetched full prices. For next week 42,800 packages are printed. In Calcutta 23,000 packages were offered. Common to medium sorts were lower, but there was a steady demand for the better grades.—*The Produce Markets' Review.*

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	20,359	0	0
Mr. Campbell Hunt	60	0	0
Mr. Norman Mather	10	0	0
Mr. R. Lescher	25	0	0
Mr. J. C. Abbott	100	0	0
Mr. G. R. Strachan	20	0	0
Mr. G. E. Bewley	10	0	0
Dr. J. S. Nicolson	30	0	0
Mr. H. G. Bonner	20	0	0
Mr. R. H. Crowther	10	0	0
Mr, J. Stuart	500	0	0
Wynaad Planters' Association	200	0	0
Total Rs...	21,344	0	0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed	3,207	14	0
Mr. L. H. Ley	15	0	0
Mr. A. Yates	50	0	0
Mr. A. H. Dixon	100	0	0
Mr. W. O. Milne	50	0	0
Dr. J. S. Nicolson	50	0	0
Mr. H. L. Cuthell	50	0	0
Wynaad Planters' Association	316	0	0
Mr. S. M. Pinto	25	0	0
Total Rs...	3,863	14	0

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 47.] NOVEMBER 20, 1915. [PRICE AS. 8,

THE U. P. A. S. I.

(INCORPORATED)

Contents.

We publish an article on Radioactivity and Plant growth.

We are indebted to the *Indian Planters' Gazette* for the report by Mr. Findlay Shirras, Director of Statistics, on the Tea Industry of 1914. Not without reason is it headed a Prosperous Year. It takes up a large space in this week's issue but it is of great interest to the present and future that we have no hesitation in preseuting it to our readers.

The South Indian Planters' War Fund continues to swell and we hope before the end of the year that the total will have reached a figure beyond even the proposer's sanguine hopes.

The Overseas Air Craft Fund continues to have slight additions made to it each week.

We hope that the late rise in prices in the coffee market will continue and that this product will be bought by the home market and increase the consumption of the British grown Berry to the exclusion of the foreign grown article. Its consummation is devoutly to be hoped for, but it does not do to be too hopeful.

Regarding an advertisement appearing in our columns we would state that the advertiser has left samples of his wares in our office which can be seen by intending purchasers.

The following has just been received by the Editor too late to insert in our Correspondence colums but we do not wish to hold it over till the next issue:—

SIR,—The following excerpt from a letter received to-day from a Peermade Planter Mr. R. E. Haslam, now in the 6th Cavalry Sialkot Brigade in France, may interest men of military age still left in Planting Districts:—"One thing more, men are wanted and if young fellows can be spared from India all available should come. One can only realise the urgent need of men and more men when one comes to Europe. Every available man is wanted. Yours faithfully J. J. Murphy"

RADIOACTIVITY AND PLANT GROWTH.

A fertiliser may be conveniently defined as any commercial material which, when added to a soil that has been brought into suitable condition for the growth of plants, produces an increased yield in crop production. In producing this result a fertiliser may act in various ways, bringing about an improvement in the chemical, physical, or biological conditions of the soil, and generally in all of these. An improvement in all these three classes of soil conditions may also be brought about by other farm operations, as by tillage, green manuring, and the rotation of crops. To what extent these latter operations should be supplemented, or even in a measure replaced, by the use of fertilisers so as to lead to the most profitable returns is a matter which has given rise to a great deal of controversy, and there still remains considerable differences of opinion on the subject. This is due in a large measure to the fact that the results obtained from experiments carried on locally and under special conditions of farming are often quoted as applying to the whole country, and to conditions of farming of an entirely different type. It is quite evident however that any set of rules governing the use of fertilisers in farm practice are only applicable when all conditions of soil fertility, climate, cultivation, and crop production are about the same. Fertilisers must therefore be used differently under different conditions, and it is universally admitted that when intelligently employed, where the conditions warrant it, the use of the proper fertiliser brings profitable returns.

A great many forms of fertilisers are used, but all those commercial products which are recognised as of value in the fertiliser trade have the common feature of containing one or more of the elements, nitrogen, potassium, phosphorus, and calcium. These elements are therefore spoken of as fertilising elements.

It is further recognised that in a very general way the value of a material is proportional to the percentage of the fertilising constituent or constituents, present in soluble form. Because of its wide distribution, calcium can usually be obtained locally, and consequently it does not enter into the fertiliser trade in the same sense as the other fertilising elements. To each of the three remaining elements is given by common consent and as trade practice a definite value per unit, which varies with the form in which the element occurs; the price set on a standard fertiliser, while thus in a sense an arbitrary one, is nevertheless determined in a scientific way by multiplying the percentages of the constituents present by their prices per unit and adding the products.

If nitrogen, potash, and phosphoric acid are absent, the fertilising value of the material as calculated in this way will be zero: and no material, with the exception of certain calcium compounds, as lime and gypsum, that does not contain one or more of the constituents referred to is recognised at present by agricultural scientists as having commercial value as a fertilising agent for general farming.

Notwithstanding these facts there have frequently been placed on the market from time to time various so-called fertilisers which contain little or none of the recognised fertilising elements even in an insoluble form. As a rule these materials consist simply of ground rock, usually of volcanic orgin from various sources, and for which an arbitrary price is asked out of all proportion to the value of the small amount of the fertilising

elements which may be present. Some of these materials, although exploited to quite an extent in the past, have later fallen into disfavour and are now no longer used by anyone, but others of more recent development are still being placed on the market under different trade names. One of these new materials, which is known as "radioactive manure" consists of low grade uranium-radium ores or ores from which the uranium has been ex racted, and it is claimed to bring about by virtue of its radioactivity phenominal increase in crop yields when mixed with barnyard manure and applied to the soil. Within the past few years the use of this material as a fertiliser has been quite extensively advertised in various parts of the world, and accounts have been given in various scientific publications of numerous results which have been obtained in pot and field tests using radioactive material from different sources.

Every physical agent known when exceeding a certain minimum intensity is able to affect in a marked degree the germination of seeds and the growth of plants. It would therefore be expected that the rays from radioactive substances, when present in suffieient intensity, would likewise have an influence on plant growth. A great many experiments have been made along this line, and the literature on the subject is already very extensive. Unfortunately in many of the experiments which have been made, no mention is made of the amount of radioactive material used nor of the intensity of the radiations emitted by it. Consequently such experiments can not be duplicated by others, and the results reported are therefore of little value, for it could have been predicted that a very intense radiation would have an injurious effect on plant growth, while radiations of moderate intensity might exert a beneficial effect. Furthermore, owing to an insufficient knowledge of the properties of radioactive rays, many experiments have been carried out in such a way that the effects which were attributed to the rays could not possibly have been due to this influence.

In addition to experiments on the use of the radioactive elements as fertilisers many tests have also been made during the last few years of the action on plants of still other elements which are not recognised as essential to the growth of plants. Among the different elements which have been studied in this way may be mentioned copper, nickel, zinc, and lead. These elements are of rare occurrence in the soil, and are ordinarily recognised as plant poisons, but quite remarkable benefits have been obtained by the application to the soil of a very small quantity of a soluble salt of these elements. Plants so treated are said to have been stimulated, and because of the small amount of the material necessary to produce noticeable results, these compounds when used in this way are spoken of as "catalytic fertilisers."

When consideration is taken of the facts: (1.) That the greatest quantity of radium which can exist in an ore amounts to only 0·00003 per cent: (2) that the intensity of the radium rays is limited by the quantity of radium present; (3) that all rays, like all chemical substances, must exceed in intensity or concentration a certain limiting value to produce any noticeable results, or any results whatever; (4) that radium costs £24,000 per gramme; and (5) that the activity of radium or any other radio-active element cannot be increased by any treatment whatsoever, but remains unchanged in whatever state of combination it may exist, it seems incredible that radium or any of its products can have any economical application as a fertiliser in general farming; and still less credible that the so-called radioactive manure has any value, as far as its radioactivity is concerned, since the radium already present on an average, in an acre-foot of soil, is about

100 times greater than is contained in the quantity of radioactive manure commonly recommended for application to an acre.

Many experiments which have been made in studying the influence of the radio-elements when freed from their ores, on the germination of seeds and the growth of plants, and from the results obtained it is to be expected that in botanical research, and possibly in greenhouse practice, where the results obtained may justify the expense involved, the raido-elements may prove of considerable value; but when consideration is, taken of the scarcity of these elements it does not follow from any experiments yet described that such elements have any practical application as a fertiliser in general farming. (*Bull. No. 149. U. S. Dept. of Agriculture,*)

During the past two years Mr Sutton has been conducting an elaborate series of experiments at the trial grounds at Reading to thoroughly test the effect of radium on plant growth. In some series of these experiments the radium salts were mixed with the soil, in others they were enclosed in vessels either of earthenware or glass in order to allow only certain of the rays to penetrate into the soil.

In no case was it apparent that any of the preparations of radium employed had a beneficial effect on the growth of the crops, and in not a few instances there were definite indications that the radium preparations had exercised an adverse influence on the plants. We understand that there are different methods of extracting radium from its ores, and hence it may be that radium residues obtained from other sources may have, as is indeed claimed for them, beneficent, effects. Pending, however, the demonstration of these effects we are bound to conclude from the first thoroughly comprehensive trials made in England that the claims for radium as a stimulator of plant growth have not been established. As the crops showed, a shillings worth of farmyard manure or ninepennyworth of a complete artificial fertiliser produced far better results than a nine shilling dressing of radium ferliliser. On those who seek to sell these radium preparations to the gardener and agriculturalist the onus lies to show either that Mr. Sutton's experiments are faulty, or that certain forms of radium residues not employed in the Reading experiments possess properties absent from those used at Reading.—(*Gardeners Chronicle. LVIII* 1501.)

Coffee.

A further sharp rise in the Brazilian exchange to 15½*d.* on Wednesday has not been fully maintained, as it has given way to 14½*d.* This constant fluctuation has rather disorganised business. Santos prices have been unsettled from day to day, although on the whole a fair business has been done at higher prices than have been current since the beginning of the War. There has also been a rather better export business in other mild descriptions, and this should be increased now, as information has just been received that the French Government have agreed to admit Coffee into France without the extra Customs surtax, if originally imported from British Colonies. Hitherto the surtax has quite prohibited trade with France, and although the concession at present will only apply to Jamaica, India, and East Africa, yet there ought to be a fair trade in these growths. A moderate business has been done in mild descriptions at quite steady prices, while some enquiry for bold London cleaned Costa Rica has revealed the fact that there is not much of this description remaining on offer.—*The Produce Markets' Review.*

TEA.

The Tea Industry.

Report for 1914.

A Prosperous Year.

The twentieth report on the production of tea in India dealing with the production in the year 1914, has been issued by the Department of Statistics, dated 17th September, and signed by Mr. Findlay Shirras, Director of Statistics. The report states:—

The year was a prosperous one for the tea industry. The production during the year surpassed the record crop of 1913. The war has certainly had a beneficial effect on the tea trade, which was fortunate in having a large outturn coupled with a high price. This price level was maintained throughout the year by the increased demand in the consuming markets. In the local markets, however, business was less satisfactory than last year. The despatch of British troops to Europe made a considerable difference to the demand for tea in India itself.

Area Under Tea.

The total area under tea in 1914 was 622,600 acres, which is 2 per cent greater than that in the preceding year. The area abandoned in the year was 3,900 acres, while the new extensions (including replanting in areas abandoned in previous years) amounted to 16,400 acres. Thus the net increase during the year was 12,500 acres. The figures are for the most part those reported by planters. In the case of those plantations for which figures are not so reported, estimates have been prepared by local officers. In the year under review such estimates have been made in respect of 2 gardens out of a total of 297 gardens in Bengal, in respect of 26 gardens out of a total of 762 gardens in Assam, and in respect of 37 gardens out of a total of 256 gardens in Southern India. Including the estimated area, the total area under tea in 1914 was divided between the different provinces as shown below:—

	Area acres.	Increase (+) or Decrease (—) per cent.
Assam ...	376,000	+ 2·3
Bengal ...	159,100	+ 2·0
Southern India ...	65,000	+ 2·2
Northern India ...	17,300	...
Bihar and Orissa ...	2,200	...
Burma ...	3,009	...

The cultivation of tea in India has been mainly concentrated in tracts where a heavy rainfall and a humid and equable climate permit of repeated flushes and pluckings of the leaf. Eighty-five per cent. of the total area under tea in India lies in Assam (in the Brahmaputra and Surma Valleys) and the two contiguous districts (Darjeeing and Jalpaiguri) of Northern Bengal. The elevated region over the Malabar coast in Southern India (including the Native State of Travancore, and the Madras districts of Malabar, Nilgiris, and Coimbatore) contains over 10 per cent., of the total.

Out of the total area of 622,600 acres for which either returns or complete estimates have been received 566,500 acres were reported to have been plucked during the year as against 556,100 acres in the preceding year. On the remaining 56,100 acres, the plants were either too young to be plucked or were not plucked for other reasons.

PLANTATIONS.

The total number of plantations was 4,405 in 1914 as against 4,380 in the preceding year. In Burma, where tea plants are grown scattered in the jungle, each village tract containing tea plants has been taken to represent on the plantation. The plantations vary greatly in size in the different provinces. In Assam 762 plantations are reported to have a total area of 376,048 acres under tea in 1914, that is, an average of 494 acres per plantation. In Bengal 536 acres is the average of 297 plantations, and in Travancore 409 acres of 95 plantations. In Madras, the United Provinces and Bihar and Orissa the average is much smaller, being about 163 acres, 129 acres, and 98 acres, respectively. In the Punjab, where tea cultivation is conducted on a small scale, the average area is only 3 acres. The figures which refer to the year 1914, relate only to tea-bearing areas and do not iuclude the area in the occupation of planters but not under tea cultivation.

PRODUCTION.

The total production of both black and green teas in 1914 is reported to have been 312,821,000 lbs.. divided between the different parts of India as follows:—

	Lbs.
Assam	208,227,000
Bengal	75,373,000
Southern India	24,618,000
Northern India	4,321,000
Bihar and Orissa	282,000
Total...	312,821,000

Black tea represents 309,771,000 lbs. The net increase over the preceding year amounts to about 6 million lbs., or 2 per cent., almost entirely in black tea. It should, however, be borne in mind that these figures cannot be taken as entirely accurate, for, as already stated, estimates had to be made for as many as 65 gardens for which returns were not furnished by planters. The following table shows the variations in the area and production of tea in each of the last ten years, the average of the ten years 1901 to 1910 being taken as 100 in each case:—

(Decennial average 1901—1910 = 100).

	Variations in Area.	Production.
1905	98	97
1906	99	105
1907	100	107
1908	102	108
1909	103	113
1910	105	115
1911	107	118
1912	110	130
1913	113	134
1914	116	137

It is noticeable that, while the area under cultivation has increased by 16 per cent. in the decade, the increase in production has been one of 41 per cent. Burma is excluded from those calculations for the reason that the produce of the Burma tea gardens is almost wholly converted into *letpet*

(wet pickled tea), which is eaten as a condiment. In 1914, 602,800 lbs. of *letpet* were manufactured as against only 4,500 lbs. of leaf tea back).

Average Production per Acre.

The average production of tea per acre varies very greatly in the different districts.

The highest productiou in the year was in Darrang (Assam), namely 691 lbs. per acre, and the lowest in Hazaribagh (Bihar and Orissa), namely 261 lbs. The average production in the whole of India (excluding Burma) was 554 lbs. per acre plucked, the same as in the previous year. The weather conditions were, on the whole, favourable from May to July. The following three months were only fair, and an early cold weather checked growth severely in November and December. Very few fine quality teas were made in any district, but the average throughout the season was good. In the Brahmaputra Valley districts of Assam a few of the second flush teas were very good and the autumnal crop was fairly good, but the bulk of the crop was of a plain, though useful, character. In Cachar and Sylhet the crop was well above the average and was very good throughout the season. In Jalpaiguri (Duars) the crop on the whole was fairly average. In Darjeeling the crop was disappointing throughout, particularly the second flush teas; the crop from this district was the poorest manufactured for some years past. The teas made in the Terrai (Dehra Dun, Kangra, etc.) were, with few exceptions, inferior to those made in the previous season.

Green Tea.

The figures of production given above include both black and green teas. The difference between the two kinds of tea arises from the different methods of preparation. Briefly the distinction is that the process of fermentation, which gives to black tea its colour, is avoided or arrested in the case of green tea. The total quantity of green tea reported to have been manufactured in the year under review is 3,050,000 lbs. as compared with 3,272,000 lbs. in 1913 and 4,825,000 lbs. in 1912. A little less than two-thirds of the total quantity was manufactured in the Kangra Valley (Punjab) in the year under review. Bounties were paid on green tea from the Tea Cess Fund up to March 1909, but since that date no bounties have been paid and the production continues to decline.

Exports.

The most striking features of the trade of 1914-15 are as follows. The total exports by sea improved by 11 million lbs., or nearly 4 per cent., as compared with 1913-14. Shipments to the United Kingdom, to which 72 per cent. of the exports of Indian tea is directed, increased by 28,231,000 lbs., or 13·5 per cent. Of the other countries in Europe, France took 528,000 lbs., and Italy 73,000 lbs. more than in 1913-14. On the other hand, the exports to Russia, Germany, Turkey, Austria-Hungary, and Holland showed a decrease of 13,762,000 lbs., 513,000 lbs., 264,000 lbs. 113,000 lbs., and 30,000 lbs., respectively. The total exports to Europe excluding the United Kingdom, showed a net decrease of 14,089,000 lbs., as compared with the year 1913-14. Of the African countries, shipments to all declined, the only exception being Natal, which showed an increase of 41,000 lbs. Of the American countries, the United States of America and Chile took 795,000 lbs., and 138,000 lbs., more than in 1913-14, while the exports of Canada declined by 614,000 lbs. In Asia the best customers of Ind an tea are China, Ceylon and Turkey (Asiatic), and the exports to them declined by 2,698,000 lbs., 607,000 lbs., and 1,600,000 lbs., respec-

tively. The Straits Settlements took 67,000 lbs., less than in 1913-14. Shipments to Persia, Arabia, and Aden, however, increased by 1,803,000 lbs. 86,000 lbs., and 10,000 lbs., respectively. But the total exports to Asiatic countries declined by 3,428,000 lbs., Australia, New Zealand, and the Fiji Islands took between them some 1,286,000 lbs, more than in 1913-14. Exports by land declined by 411,000 lbs. or 19 per cent. The bulk of the exports by land goes to Afghanistan and other countries beyond the north-western frontier. If the exports both by sea and by land are taken together, the net increase in 1914-15 was nearly 11 million lbs. or 3·7 per cent,

In view of the disorganisation of shipping and the consequent congestion of the docks and warehouse in Calcutta on account of the war, the trade figures are quite satisfactory. The decrease in the exports to Russia and other important markets of Indian tea was made good by the increased shipments to the United Kingdom.

Compared with 1913-14, the shipments from Calcutta in 1914-15 increased by nearly 18 million pounds or 8 per cent., but those from Chittagong declined by 8 million pounds or 15 per cent. Shipments from Bombay and Karachi and South Indian ports continued to increase.

A Comparison.

It is interesting to compare the exports of tea from India, Ceylon and China, the three rival tea-supplying countries in the world's market. The exports from India and Ceylon have increased almost steadily in the last nineteen years—those from India by 101 per cent. and those from Ceylon by 74 per cent. ; but the exports from China have declined by 17 per cent.

Consumption.

In the year under review India supplied 58 per cent. of the total quantity consumed in the United Kingdom, Ceylon supplied some 29 per cent. and China only about 4 per cent., of the total. The average annual consumption of tea per head of population of the United Kingdom is 6⅔ lbs., and of this quantity Indian tea constitutes nearly 3¾ lbs. The consumption per head in New Zealand and Australia exceeds even that in the United Kingdom namely, 7·45 lbs. in New Zealand and 6·83 lbs. in Australia. In Canada it is 4·83 lbs., per head, in Holland ·2 lbs, and in Russia only a little over 1 lb.

Tea Cess Fund.

In 1903 an Act known as the Indian Tea Cess Act (IX of 1903), was passed at the request of the tea trade for promoting its sale and manufacture. Under this Act a duty of ¼ pie per lb., is levied on all Indian Teas exported. The whole of the amount collected is made over to a fund, known as the Tea Cess Fund, which is placed in the hands of a Committee appointed for the purpose, and Government merely acts as a revenue collecting agency. The total amount collected in 1914-15 was Rs 3,94,000 as against Rs.3,79,000 in 1913-14. The allotments for the season 1915-16 have been to the United States (Rs. 1,80,000), to the United Kingdom (Rs 90,000), to the continent of Europe (Rs.75,000), and to India Rs.90,000 The allotment of Rs.90,000 for work in India is highly satisfactory and full of promise for increasing the consumption and pushing the sale of tea in India. The services of an expert to direct the work have, it is understood, been secured. Owing to the War, about Rs.1,50,000 of the sums allotted in 1914-15 to the United States and the continent of Europe were not spent. The sum was used as follows: Rs. 75,000 for the purchase of tea for the use of the field hospitals of the Allied Troops and the Belgian

refugees in England; Rs.30,000 for the distribution of tea to the Belgian refugees in the United Kingdom; Rs.15,000 to the Vice-Consul for Russia in Calcutta for the purchase of tea for the Russian field hospitals: Rs.30,000 for the purchase of tea for the field hospitals of the Allied troops outside the United Kingdom. Up to March, 1909, a portion of the collection was paid to the planters in India as bounty on the manufacture of green tea, but no such bounty has been paid since that date.

Capital Employed.

According to the returns of the Registrars of Indian Joint Stock Companies and the accounts of Companies registered in the United Kingdom as reported by the Indian Tea Association, the capital of joint stock companies engaged in the production of tea during 1914 amounted to about Rs.30 crores or over £20.1 millions. *viz.*,- Companies registered in India Rs.4,30,56,603; Companies registered in the United Kingdom, £17,284,349= Rs.25,92,65,220; total Rs.30,23,21,823.

Particulars are available concerning the present position of 98 companies registered in India which have an aggregate paid-up capital of Rs.301 lakhs. Of these companies 91 companies declared dividends for 1913, amounting to 17.7 per cent on the aggregate capital of Rs.2,82 lakhs. Eighty-six companies have up to-no declared dividends for 1914, amounting to 15·6 per cent. on their aggregate capital of Rs.2,60 lakhs. The value per Rs.100 of joint stock capital as calculated on the prices of the shares of 92 companies quoted in the Calcutta share market was Rs.166 in March, 1914, and of 95 companies was Rs.181 in March, 1915.

Similar details are available regarding 68 companies registered in the United Kingdom with sterling capital of £10·4 millions (Rs.15,63 lakhs). The total dividends declared in 1913 by 65 companies out of them with an aggregate capital of £10·2 millions (about Rs.15,26 lakhs) amounted to 13·3 per cent. In 1914 the dividends so far declared by 42 companies came to 8·4 per cent. on their aggregate capital of about £8·7 millions (Rs.12,91 lakhs).

Messrs. Barry and Company of Calcutta issued in June, 1915, a summary of the audited accounts for the past year of 102 joint stock tea companies incorporated in Calcutta, representing a total paid capital of Rs. 3,15,60,810. It shows a surplus on the year's working, exclusive of commission on the profits and debenture interest, of Rs. 65,37,000, the average profit being 20·7 per cent on the capital involved. Out of the above sum dividends have been paid representing an average return to shareholders of 16·3 per cent.

Present Position of Tea.

The prospects of the tea industry continue bright. The demand for supplies for troops coupled with the prohibition of the manufacture of *absinthe* in France and of the sale of *vodka* in Russia will no doubt result in a larger demand and according to some a demand which may temporarily outstrip production. It may be interesting to note that the exports by sea from British India of Indian Tea in the present year are 14 per cent. higher than the corresponding period (April to August) of last year. The exports in the five months of the present year (1915) are 11,658,000 lbs. more than in the corresponding period of the year under report (1914) and 15,136,000 lbs. more than the normal. Owing to the times being abnormal it is unsafe to estimate with any pretence at accuracy the immediate future of the tea position. It would seem 1) that the ordinary supply for the United Kingdom for the remaining months of 1915 is assured; and (2) that some increase in production on last year is possible. The important factor confronting the tea planter at the present

time is (*a*) whether the consumption at 1*s*. 10*d*. and 2*s*. will be the same as at 1*s*. 2*d*. and 1*s*. 4*d*. per lb. and (*b*) whether the consumption in the United Kingdom will be affected, should it be necessary to impose an additional duty to meet the heavy war expenditure. In the Boer War when the duty was raised to 8*d*, per lb. the consumption of tea in tbe United Kingdom fell from 6'17 lbs. per head of population to 5'99 lbs. and it began to recover only in 1906 when the duty was again reduced to 5d. Since 1906 consumption has increased and in 1914 it stood at 6.84 lbs per head. In 1915, the deliveries up to date are a very little ahead of 1914. On the whole it seems at the moment as if the intentions of the Home Government as regards the tea duty were the key of the position. Since the above was written, adds Mr. Findlay Shirras, the duty on tea (which was 5d. per lb until 1914 November when it was raised to 8*d*.) has been raised to 1*s*. in Mr. McKenna's second War Budget of the present financial year introduced on 21st September.—*The Indian Planters' Gazette.*

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	21,344	0	0
Mr. T. J. Kenna	50	0	0
Mr. J. B. Cook	60	0	0
Messrs. T. Stanes & Co., Ltd.	250	0	0
Mr. J. Hudson	25	0	0
" A bet won "...	10	0	0
Mr. N. D. Pollock	10	0	0
Mr. J. R. Vincent	100	0	0
Mr. Wm. Hendry	20	0	0
Mr. P. Napier	20	0	0
Mr. E. C. Walker	15	0	0
Mr, J. W. G. Bisset	50	0	0
Mr. S. H. Powell	40	0	0
Total Rs...	21,994	0	0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed	3,863	14	0
Mr. J. B. Cook	40	0	0
Mr. G. M. Beville	20	0	0
Total Rs...	3,923	14	0

Increasing Coffee Consumption in United Kingdom.

It is curious to note that while France is using more tea, owing to its ease of preparation, in the united Kingdom the consumption of coffee has risen. For the past seven months the increased consumption of the United Kingdom was 8,375 cwt. (cwt. 112 pounds , and imports were up by 278,952 cwts. This advance is stated to be due partly to the large number of Belgian refugees, who cannot be induced to drink tea, and also to the sale of coffee at many of the camps and in some of the public houses after 10 o'clock. A large number of penny (2-cent) coffee bars have also sprung up over the west end of London, and these places, though frequented to a great extent by our new foreign population, have also obtained a fairly large clientele from the English working classes.—*Simmons' Spice Mill.*

OVERSEAS AEROPLANE FUND.

DETAILS OF SUBSCRIPTIONS FROM THE WYNAAD PLANTERS' ASSOCIATION TO THE OVERSEAS AEROPLANE FUND THE TOTAL OF WHICH HAS BEEN PUBLISHED IN THE "PLANTERS' CHRONICLE" OF 13TH NOVEMBER, 1915.

Names.	*Amount.* Rs.	a.	p.
N. C. Whitton, Esq.	5	0	0
T. S. Gillatt, Esq.	10	0	0
Mr. Arumuga Konar	5	0	0
„ T. N. Manikkam Pillay	3	0	0
„ C. Nagalingam Pillay	3	0	0
„ F. Curtis	2	0	0
„ N. P. Karunakaran	3	0	0
„ K. Balakrishna Nair	2	0	0
„ K. S. Wariyar	2	0	0
„ V. K. Krishna Menon	2	0	0
T. S. Dobree, Esq.	10	0	0
R. F. Vinen, Esq.	10	0	0
A. Ewrett Vernede, Esq.	5	0	0
M. W. Mackay, Esq.	5	0	0
Mr. A. Samuel	1	0	0
„ F. Laporte	1	0	0
„ J. Dagama	1	0	0
„ M. Sankunni	1	0	0
„ Govindan Maistry	2	0	0
„ T. K. Gopalan	1	0	0
„ C. F. David	2	0	0
„ D. D. Thomas	3	0	0
E. A. Chesman, Esq.	5	0	0
Mr. A. L. D'Souza	2	0	0
„ M. Kellappan	1	0	0
H. C. Leslie, Esq.	5	0	0
Mr. T. S. S. Mani Iyer	3	0	0
„ Nicholas Pinto	3	0	0
„ C. D'Cruz	1	0	0
„ G. Rodrigues	1	0	0
„ J. S. D'Cruz	3	0	0
„ D. B. Rego, Writer	3	0	0
„ J. Rego	1	0	0
„ M. Cabrial	1	0	0
„ S. P. D'Cruz	1	0	0
„ Koran	2	0	0
„ J. G. Sequira	0	8	0
„ Monteiro	0	8	0
„ Joseph	0	8	0
„ Abdulla Mopila	0	8	0
D. P. O'Brien, Esq.	5	0	0
W. Tippetts, Esq.	5	0	0
Mr. Manual Davis	2	0	0
„ V. F. Macedo	1	0	0
„ P. Appa Nair	0	8	0
„ N. M. Muthian	1	0	0
Carried over...	127	8	0

Names.	*Amount.*		
	Rs.	*a.*	*p.*
Brought forward...	127	8	0
Mr. M. D. Rosario	1	0	0
T. P. Gauld, Esq.	5	0	0
J. W. G. Bisset, Esq.	30	0	0
Mr. Doney	1	0	0
W. C. Craig, Esq, ...	5	0	0
Mr. J. I. Johnson	1	0	0
„ V. A. Kandaswamy Pillay...	1	0	0
„ A. E. D'Silva	1	0	0
„ T. S. Appoo Pillay	2	0	0
„ M. Damodaran Naiken	1	0	0
W. Morres, Esq.	10	0	0
Mr. J. N. Gomes	2	0	0
H. B. Winterbotham, Esq.	10	0	0
E. R. Howlett, Esq.	10	0	0
Mr. M. Kumaran	2	0	0
„ P. Sankaran	1	0	0
„ A. T. Sankaran	2	0	0
„ F. V. Govindan	5	0	0
„ P. Mohamad Ali	1	0	0
„ P. R. J. John	1	0	0
„ M. P. A. D'Cruz	2	0	0
„ P. F. Thomas	1	0	0
„ K. Venkataswamy Naidu	0	8	0
„ Nanjappa Gouda	2	0	0
„ V. S. Mohamad Eussoff	1	0	0
P. C. Guard, Esq.	10	0	0
D. H. McLeod, Esq.	10	0	0
S. H. Powell, Esq.	10	0	0
J. C. Blackham, Esq.	10	0	0
P. A. Naylor, Esq.	5	0	0
J. Stuart, Esq.	10	0	0
R. Copland, Esq.	10	0	0
J. Hudson, Esq.	25	0	0
...	316	0	0

LABOUR DEPARTMENT.

(Camp) Srivilliputhur,
16th November, 1915.

G. O. No. 254 dated 21st October, 1915, empowers the following Officers of the Department to attest contracts under Madras Act I of 1913 :—

1. Mr. Marc Albert Clementson.
2. Mr. David John Duncan.
3. Mr. William Augustus Walton.
4. Mr. Clarence Archibald Beveridge Bartels.

AYLMER Ff. MARTIN,
Director.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 48.] NOVEMBER 27, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish an article taken from the "*Monthly Bulletin of Agricultural Intelligence*" on the Fermentation of Tea and from the same source on the germination of coffee seed.

The Proceedings of the Wynaad Planters' Association meeting are published as also the Minutes of a meeting of the South Mysore Planters' Association.

From the *India Rubber Journal* we take and publish the Overseas trade in Rubber in September for the three years 1913, 1914 and 1915.

We reprint tea report of Messrs. Ewart Maccughey & Co., Ltd., on Tea. The average prices are given and the difference in price realised in September 1914 and September 1915 must be a matter of congratulations to the tea planters.

The South India Planters' War Fund now amounts to Rs. 24,434 and in connection with this a couple of letters have been received who have joined His Majesty's Forces, gratefully thanking the Planting Community for the interest taken in them all in starting this Fund. We may mention that Mr. Jonas, at one time Scientific Assistant for Coorg, has received a Commission as I. A. R. O. and is attached to the Queen's Own Sappers and Miners in Bangalore.

A short article published by the Agricultural Research Institute on Nitrogen is reproduced.

A continuation is made on the Cultivation and Preparation of coffee taken from *Simmons' Spice Mill.*

The extract taken from *The Morning Post* sent us by a Correspondent is interesting as it refers to Lieut. A. L, Hill, a South Mysore Planter, who, we ars glad to hear has rejoined his unit. We take off our hat to Private G. Howe.

There will be a Committee Meeting of the South India Branch of the Rubber Growere' Association at Quilon on December 11th.

Messrs. Peirce, Leslie & Co., Ltd., have kindly sent us the copy of a letter addressed to the British Government with reference to the prohibition of Export of coffee from the United Kingdom. We shall publish it next week.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

The Fermentation of Tea.

The following account of studies in the fermentation of tea by A. Sculte in Hofe is taken from the *Monthly Bulletin of Agricultural Intelligence* (*VI. 5.*)

In a garden in the Doars where the tea was made from shoots of which the first and second leaves had opened, the crop was divided into seven qualities and classed according to the yield and relative value of these seven qualities, thus :—

	Relative yield.	Relative market price.
Broken Orange Pekoe ...	7·5	100
Broken Pekoe	22	62·5
Pekoe	33	47
Pekoe Souchong ...	16	40·5
Broken tea	12	34·5
Pekoe fannings	8	37·5
Dust	1·5	25

The question then arose as to the transformations taking place during the preparation of the tea leaves and to the factors which determine the value of the different qualities. The changes undergone by the astringent substances play an important part in determining the value of tea and the tannins are present in all stages of development of the leaf and in all qualities of tea as shown below.

	Tannin content per cent.	
	I.	II.
Freshly gathered leaves ...	10·5	11
The same leaves after rolling ...	16	17
The same leaves ready for sale ...	7	12
Broken Pekoe		13
Pekoe		12
Pekoe Souchong		11·5
Souchong		10·5
Shoots with one leaf		12
Shoots with two leaves		8·5
Shoots with three leaves		8
Shoots with four leaves		10·5
Shoots with five leaves		5·0
Shoots with more leaves		3·5

The tannin content is higher in the young leaves and in the best qualities of tea. Assuming that the quality of tea be connected with the amount of tannic substance it contains, then as the teas grown at the highest elevations are the most aromatic and stimulating, they should also contain the highest percentage of tannic substances. In order, to test this matter three varieties of buds were gathered in Ceylon at altitudes of 1,500 and 6,500 feet and analysed for tannin.

Altitude of garden.	Tannin content per cent.		
	Manipur indigenous.	Singlo indigenous.	Hybrid Assam x China.
1,500 feet ...	7	9·5	9
6,500 feet ...	10	12	11·5

The tea coming from the higher altitude was richer in tannin.

During rolling the acid content as well as the soluble tannic substances increase, but these latter decrease, during subsequent fermentation.

	Acidity.	Tannic content per cent.
Before rolling	0·95	3·5
Leaves rolled for 20 minutes ...	1·80	6·1
Leaves rolled for 40 minutes ...	2·70	6·0
Leaves rolled for 1 hour ...	2·90	5·2
Leaves rolled for 2 hours ...	2·40	4·7
Leaves rolled for 3 hours ...	2·30	4·0
Leaves rolled for 4 hours ...	2·30	3·5

By acidifying the leaves with sufficiently large quantities of lactic or acetic acid to prevent the development of bacteria for some hours the change of the green colour of the leaves to a yellowish red hue, although hindered, was not prevented. The transformation of the tannic substances during fermentation is therefore certainly not prodnced by bacteria, but is due to atmospheric oxygen with the help of enzymes.

Germination of Coffee Seed.

The following information is extracted from the *Monthly Bulletin of Agricultural Intelligence* VI. 5.

In 1914 the Secretary of Agriculture of the State of San Paulo, Brazil decided to set apart a portion of the Forestry Garden at St. Paulo as an experiment station for growing Coffee. The tests were to include various cultural details as well as the testing of species and varieties and selection. The first report on this work contains the results of some experiments on the germination of Coffee seeds. The results of the comparative sowings of whole fruit of seed without pulp, and of decorticated seed, (freed also from the parchment-like membrane) are shown in the adjoining table, from which it will be seen that the best sowing is that effected with whole fruits.

Variety.	Date of sowing.	Germination percentage. Coffee fruit entire.	Coffee freed from pulp.	Decorticated coffee freed from pulp.
Brazilian, ...	June 10	75·7	81·6	93·0
Sumatra ...		65·2	52·4	44·3
Brazilian ...		44·1	28·8	15·4
Maragogipe ...	July 1	60·3	20·6	35·2
Bourbon ...		76·6	50·1	19·5
Stenophylla ...		38·6	43·8	27·6

R. D. A.

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association.

Proceedings of a Meeting held in the Meppadi Club, on the 10th November, 1915.

PRESENT.—Messrs. J. W. G. Bisset, J. C. Blackham, T. P. Gauld, T. S. Gillatt, D. H. McLeod, S. H. Powell, A. E. Vernede and N. C. Whitton (Honorary Secretary). *Visitors*:—Messrs. Craig, Dobree and Mackay. Mr. McLeod in the Chair.

1991. *The Proceedings of last Meeting* were confirmed.

1992. *The late Lieut. G. R. R. Carson Parker. R. F. A.*—The Honorary Secretary spoke as follows:—

"Mr. Chairman and Gentlemen.—It is with the deepest regret I must "ask you to-day to allow me to record the death of one of our Members, "Mr. G. R. R. Carson Parker."

"Lieut. Carson Parker,—as he was when he died,—left us a year ago "to join the Army.

"He was wounded at the Western front, on the 4th of last month "and died the following day."

"To most of us, probably nothing has brought the War nearer home "than the fact that one of our fellow Planters, who we knew so well here, "has given up his life for his country, and while we deplore his death I am "very sure we all feel very proud of him."

"A Sportsman of the best type, we sadly miss him in our little "Community here. We can picture Gay Parker as a gallant young Officer, "beloved by his men."

"It is not too much to say that the British Empire can ill afford to "lose such as he."

The following resolution was passed, the Members standing.

"This Association having learnt with very great regret the death of "Lieut. G. R. R. Carson. Parker, from wounds inflicted while serving his "country in Flanders, desires the Honorary Secretary to write to his "brother, Mr. J. Carson Parker, expressing the Members' deepest sympathy."

1993. *Roads.*—Read correspondence between the Honorary Secretary and the Chief Engineer P. W. D. *re* the Calicut—Mysore Frontier Road, Noted.

1994. *Labour Law.*—Correspondence was read with reference to the Association's High Court Case. The Meeting noted with satisfaction the decision given by the High Court.

1995. *Wynaad Taluk Board.*—Read letter from the President of the Wynaad Taluk Board asking the Association to nominate a representative for the Taluk Board, as Mr. H. B. Winterbotham's three years' term of Office had expired.

The Meeting expressed its appreciation of Mr. Winterbotham's services and it was proposed by Mr. Bisset, seconded by Mr. Gauld and passed unanimously that Mr. Winterbotham be asked to represent the Association again on the Taluk Board.

1996. *Planters' War Fund.*—The Chairman announced that Rs. 200 had been sent to this Fund being the proceeds of a Jumble sale organised by Miss Winterbotham and the Ladies of the District.

The Honorary Secretary was instructed to write to Miss Winterbotham thanking her for all the trouble she took in making the Sale such a great success.

1997. *Overseas Aeroplane Fund.*—It was announced that Rs. 341/- had been collected in the District and forwarded to this Fund.

The thanks of the Meeting were expressed to Mr. Gillatt for having collected subscriptions, a list of which was on the table.

1998. *Madras Park Fair and Exhibition.*—Read correspondence with reference to this. Noted.

Mr. T. S. Gillatt very kindly offered his "Humber" motor-car to be raffled for at the above Exhibition—the proceeds to go to the Madras War Fund. The amount of Rs. 75/- was promised in the room to get the Car to Madras.

The Honorary Secretary was instructed to get into correspondence with Messrs. Addison & Co., Ltd. and the Exhibition authorities on the matter.

1999. *Extension of Planting areas in Wynaad.*—Read letter from the Collector. The Meeting approved of the Honorary Secretary's reply.

2000. *Registration of Carts.*—Read Mr. Waddington's letter. The Honorary Secretary was instructed to reply to Mr. Waddington expressing this Association's full approval of the scheme.

2001. *Labour.*—(*a*) Read letter from the Honorary Secretary of the Anamallay Planters' Association. The Honorary Secretary to reply stating that no local labour by-laws are in existence in this District.

(*b*) The Chairman read the Secretary of the U. P. A. S. I's letter, bringing to notice the Mundakayam Association's resolution, with reference to the statements made by Mr. T. Srinivasa Mudaliyar in the *Madras Times* of the 21st September. The opinion of the Meeting was that the letter in question should be treated with the contempt it deserves.

A vote of thanks to the Chair terminated the Meeting.

(Signed) D. H. McLEOD,
Chairman.
(„) N. C. WHITTON,
Hon. Secretary.

South Mysore Planters' Association.

Minutes of a Meeting of the S. M. P. A. held at Chickanhulli T. B., on the 15th November, 1915.

The President in the Chair.

The Minutes of the last meeting were read and confirmed.

Dasara Delegate's Report.—In the absence of the Delegate this was read.

Meeting Places of the Association.—It was decided to leave the rules alone. Meeting places to be settled as far as possible at the previous meeting.

Planters' War Fund.—This was postponed for consideration at the Annual General Meeting.

Government Grant of Land.—Government orders read.

Proposed Labour Laws.—This subject was postponed pending delegates report.

Roads and Communications.—The appalling condition of some of the roads in the District was discussed. Members are requested to send in particulars to their Local Board Member.

The Honorary Secretary was requested to ask the U. P. A. to report progress made on the subject of the late delivery of mails in the Malnad as no improvement has yet taken place.

Correspondence.—Mr. Anstead's letter read.

Madras Fair.—This matter was discussed and the Honorary Secretary was requested to circulate members in order to find out what produce they were willing to send.

The meeting closed with a vote of thanks to the Chair.

(Signed) A. THOMSON,
Honorary Secretary.

OVERSEAS TRADE IN SEPTEMBER.

Rubber by Quantity.

Imports of Rubber*	1913.	1914.	1915.
From Dutch East Indies (Centals of 100 lbs.)...	N. S.	N. S.	4,564
,, French West Africa ,, ...	1,047	108	1,013
,, Gold Cost ,, ...	427	169	452
,, Other Countries in Africa ,, ...	N. S.	N. S.	4,363
,, Peru ,, ...	2,555	277	20
,, Brazil ,, ...	14,444	11,484	9,023
,, British India ,, ...	N. S.	N. S.	3,638
,, Straits Settlements and Dependencies including Labuan ...	35,360	37,304	46,274
,, Federated Malay States ...	22,719	15,734	23.905
,, Ceylon and Dependencies ...	15,619	24,877	18,918
,, Other Countries ...	38,832	22,360	2,290
Total Imports ,, ...	131,003	112,313	114,460

Re-Exports of Rubber*	1913.	1914.	1915.
To Russia (Centals of 100 lbs.)...	5,738	3,329	15,684
,, Germany ,,	14,078	—	—
,, Belgium ,, ...	4,641	—	—
,, France ,, ...	7,857	1,053	13,866
,, United States of America ,, ...	35,375	51,303	54,097
,, Other Countries ,, ...	5,204	6,280	13,160
Total Re Exports ,, ...	72,893	61,965	96,807

*Prior to 1915 these figures include waste and reclaimed rubber as well as raw rubber.—*The India-Rubber Journal.*

TEA.

Tea Brokers' Roport.

MESSRS. EWART, MACCAUGHEY AND COMPANY, LIMITED.

For the Month of September 1915.

London, 12th October, 1915.

QUANTITIES OFFERED IN PUBLIC SALES.

1st to 30th September.

		1915. Packages.	1914. Packages.
Indian	...	132,153	175,205
Ceylon	...	144,769	128,665
Java, etc.	...	48,898	11,601
	Total...	325,820	315,471

1st June to 30th September.

		1915. Packages.	1914. Packages.
Indian	...	340,866	415,845
Ceylon	...	593,430	506,816
Java, etc.	...	161,211	65,886
	Total...	1,095,507	988,547

Indian.—Although prices were still inclined to be patchy the month opened with a general feeling of more confidence and a pronounced if somewhat irregular advance. Both Assams and Dooars, if the least bit better than the average, were making good money, and from 1*s.* per lb. upwards there was a strong all round demand. The quotation for common leaf was 9¼*d.* per lb. and there was ¼*d.* per lb. to ½*d.* per lb. advance on tea generally under 1*s.* per lb., the immediate reason being of course the heavy buying for the Budget. There was quite a spurt too in the private contract business and a general seeking round for tea under 10½*d.* per lb. The auctions advertised for 13th were postponed at the suggestion of the dealers. The Duty payments on an enormous scale had caused something like a deadlock and this compliance with the wish of the buyers was with the idea of giving a chance of a "breather" to the overwrought trade. The rate of selling on the 15th was terribly slow, but the teas actually placed, although easier on the whole, did quite as well as was to be expected under the circumstances, particularly as many of the buyers who had put bids in for the Monday very naturally exercised their prerogative in withdrawing them on the postponement. Thus far in the month it had been an anxious period for all concerned, with a number of disturbing

elements at work, but better times were at hand, and the auctions on 20th, the eve of the Budget, came to a refreshingly confident room. The setback in prices had evidently brought buyers to attention and although quotations were still very irregular, there was a more satisfactory market than had been seen for weeks. From then on to the close of the month the feeling was always improving, with, in the case of common tea, a smart rise of ¼*d*. per lb. to ½d. per lb., and in fact a general advance on all tea up to 10½d. per lb. Over that there was considerable irregularity, but better grades were still doing fairly well, although there were evidences that the increasing pressure on tea for price must sooner or later adversely affect all other classes. Fine tea has been a somewhat awkward problem, bids for tipping kinds being so very far below what have ruled in other seasons. This has resulted in a good deal of taking out and although much improved offers have in many instances been forthcoming after the auction, the want of anything like keen competition in the room has at times made itself severely felt. Since the opening of this month(October) there has been a big weight of tea to tackle but the room stood up to it fairly well and buyers seemed pleased at getting it on a little better terms and quite prepared to operate with freedom. A leading feature has been the value to be found among Assams. Roughly speaking tea over 10½*d* per lb. was ½*d*. per lb. to 1*d*. per lb. down and the higher the grade the more the set back.

Ceylon.—September brought in a much better market. Any touch of improvement in quality was quickly recognised, Broken Oranges over 1*s*. 1*d*. per lb. as well as the pick of the Orange Pekoes and Pekoes making very full prices. The quotation for common advanced from 8¾*d*. per lb. to 9¼*d*. per lb. with an irregular rise of ½*d*. per lb. on tea under 1*s*. per lb. After an easy sale on 21st (the first after the Budget) there was a fairly general recovery, tea under 1*s*. per lb. being again the first to benefit by the improved demand, and advances ranging from ¼*d*. per lb. to 1*d*. per lb. were paid on common to lower medium grades. The finer gardens, too, were doing well, the only exception being in the case of extra thin teas which were difficult to get on with. Quality as a whole has not been any way remarkable and at times there was a large proportion of very plain dull tea, so that the strong prices paid were all the more marked. The averages stand at some 2*d*. per lb. above some period last season. There was a very fair export demand throughout and this was of especial service to the better grade Pekoes, and Orange Pekoes. This month's offering (October) have so far been on a fairly liberal scale. The bidding was a little slow at times, but up to 10½*d*. per lb. the tone remained fairly steady. Over this there was a good deal of irregularity and finer grades were not doing any too well.

Java.—Offerings for the month were on a fairly liberal scale averaging between 9,000 and 10,000 packages per week for the five auctions. The opening prices were decidedly easy and the inclusion of an unusually large proportion of extra low class tea did not tend to inspire confidence the result being that there were some previously unheard of quotations. The goods marks, however, received as a rule plenty of attention, but there was in the middle of the month without doubt any quantity of very cheap tea to be picked between 8*d*. per lb. and 11*d*. per lb. Buyers who realised this and took advantage of it had reason to congratulate themselves, as in the closing auctions there was a marked recovery and prices at the finish were often as much as ¾*d*. per lb. to 1*d*. per lb. up with an excited demand up to 10½*d*. per lb. The October auctions came to quite a sound market and prices as a whole were fully firm. Finer graded were perhaps a little uncertain.

The Indian sales during the month were made up as follows:—

	1915. Packages.	Average price.
Assam	57,149	1 /0½.
Cachar and Sylhet ...	23,362	10¼*d.*
Darjeeling and Terai ...	6,459	1 /1¾.
Dooars ...	24,254	10¾*d.*
Sundry and Travancore Account ...	18,810	10¼*d.*
On Shippers and Second-hand Account ...	2,119	—
Total...	132,153	—

	1914. Packages.	Average Price.
Assam	93,568	9¼*d.*
Cachar and Sylhet ...	31,797	7⅞*d.*
Darjeeling and Terai ...	12.793	11¼*d.*
Dooars	20,769	8⅛*d.*
Sundry and Travancore Account...	15,444	7⅞*d.*
On Shippers and Second-Hand Account	834	—
Total...	175,205	—

The average price of Indian Tea in Public Sale during month 11½*d.* against 8¾*d.* last year.

The average price of Ceylon Tea in Public Sale during month 10¾*d.* against 8⅜*d.* last year.

The average price of Java Tea in Public Sale during month 9⅞*d.* against 8⅛*d.* last year.—*Indian Planters' Gazette.*

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	21,994	0	0
Mr. C. C. Kent	30	0	0
Messrs. Peirce, Leslie & Co., Ltd.	1,000	0	0
Messrs. The Pudukaad Rubber Co., Ltd. ...	250	0	0
Messrs. Barber & Pascoe (November) ...	75	0	0
Mr. H. Clifton Leslie (do) ...	10	0	0
Mr. T. P. Gauld	50	0	0
Mr. M. W. Mackay	25	0	0
Devarashola Estate	1,000	0	0
Total Rs...	24,434	0	0

NITROGEN.

Azobacter and Nitrogen Fixation in Indian Soils.

The above is the title of a Bulletin (Bacteriological Series I, 4) by Mr. J. H. Walton published last August by the Agricultural Research Institute, Pusa. In the introduction, Mr. C. M. Hutchinson, the Imperial Agricultural Bacteriologist, says:—"The enormous area of cultivated soil in India which "is never likely to receive any addition of nitrogenous manures but is yet "the only source of nourishment and livelihood of millions of cultivators, "makes the nitrogen problem in this country of paramount importance "from the point of view of the transference of this element from the air to "the soil by various natural agencies. The importance of leguminous crops "in this respect cannot be overestimated, but in actual practice the fact "remains that enormous quantities of nitrogen are annually going out of "the country in the form of agricultural exports, whereas the amount actu- "ally added to the soil by the cultivation of *Leguminosae* cannot be "considered sufficient to replace this loss, nor is there any importation of "artificial nitrogenous manures in quantities worthy of consideration. "Another source of soil nitrogen remains, namely, the "non-symbiotic "organisms such as *Clostridium* and *Azobacter* which, so far as our "knowledge at present carries us, are largely responsible for the present "state of fertility of soils all over the world. *Clostridium* works under "semi-anaerobic conditions and it is probable that the nitrogen obtained "from the air by this organism does not add any considerable quantity to "the soil supply.

"*Azobacter*h, owever, has been shown to exist and perform its valuable "work in cultivated soils all over the world, and although we have at present "insufficient data upon which to base any accurate conclusions as to the "actual quantities of nitrogen obtained from the air and added to the soil "supply by this organism, there is good reason for supposing that it is "sufficiently large to support a considerable growth of natural vegetation "continuously. This result is no doubt due to the continuous nature of "the action of this organism which goes on in India at all times of the year, "so that although the actual rate of fixation is small the annual increment "may be considerable."

"The optimum conditions for growth and nitrogen fixation by "*Azobacter* are obviously of importance to the agriculturalist, and the "object of the work, the preliminary stages of which are described in this "Bulletin was to ascertain whether *Azobacter* is of universal occurrence in "Indian soils, to determine the optimum conditions for the exercise of its "specific function, and how far agricultural practice might be modified so "as to take advantage of its nitrogen-fixing power."

Some of the conclusions come to by the author are:—"Pure cultures of "*Azobacter* isolated from different soils vary in nitrogen-fixing power and "in morphological and cultural characters. These morphological and cultural "characters are constant in any particular variety."

"Nitrogen fixation in soil is increased by cultivation and the addition of "suitable carbohydrate material. We may conclude that proper soil manage- "ment should include the provision of conditions favourable to the physiologi- "cal activity of *Azobacter*, namely aeration, the presence of lime, and the "presence of available carbohydrate food. The increased nitrogen fixation "observed as resulting from the addition of humus, and the experimental "demonstration by Koch that cellulose may be acted upon by micro- "organisms in the soil so as to make it available as carbohydrate food for "*Azobacter* emphasise the importance of such agricultural operations as "tend to maintain the supply of organic matter in the soil."

COFFEE.

The Cultivation and Preparation of Coffee.

AN INTERESTING REVIEW OF THE SUBJECT OF CULTIVATION, PREPARATION AND CONSUMPTION OF COFFEE.

(Continued).

The plant differs from *C. arabica* in many respects. It is a larger shrub, sometimes attaining a height of 30 feet or more, its branches are stouter and more erect, and its leaves much larger. The fruits are about an inch in diameter, and do not drop so readily when mature as those of *C. arabica.*

A coffee grown in Java, which differs in some respects from *C. liberica*, has been distinguished by Cramer under the name *C. Abeokulae.*

Coffea robusta, Linden.—Although known everywhere by planters as "robusta" coffee, this species should probably be more correctly called *C. Laurentii*, De Wild. It occurs wild in the Belgian Congo and other parts of Central and West Africa, but its cultivation on a commercial scale has been almost confined to tho Dutch East Indies. An account of the plant and its cultivation has already been published in this *Bulletin* (1912, 10, 454), and no further reference to it need be made here.

Coffea stenophylla, C. Don.—This plant, known as the Highland coffee of Sierra Leone, is also a native of West Africa. It has been grown experimentally in Trinidad, Java, Ceylon. India and elsewhere. It grows freely, yields abundantly, but is longer in coming into bearing than *C. liberica*. It gives a highly flavoured bean somewhat like a Mocca coffee.

Coffea excelsa, Chev.—This coffee occurs wild in Central Africa at an altitude of over 2,000 feet, and has been introduced into cultivation in Java, Belgian Congo, Tonkin, and French Guinea. It has given good results in Java, being exceedingly robust, and four to five-years-old trees have yielded well. The coffee is of good quality, a small consignment of the Java product having been sold in Holland at a price equal to Java *arabica* coffee.

Coffea congensis, Froehner.—This species inhabits the river banks of the middle Congo and Ubangi districts of the Belgian Congo. It yields a coffee of good quality, and, as it is said to be resistant to Hemileia disease, it has been introduced to cultivation in some parts. Particular attention has been devoted to the variety *Chalotii in Madagascar.*

Coffea canephora, Pierre.—This is also a Congo coffee. It is a very reliable species, the best-known variety being *Kouilouensis*, which yields the Quillou coffee.

HYBRID COFFEE.—Where more than one variety of coffee is grown natural hybridisation may often take place. Unless selection is systematically carried out the plants raised from seeds produced in this way soon revert to one or other of the parents as a rule. In many countries, however, definite attempts have been made to improve the plant by artificial hybridisation. Hybrids between Arabian and Liberian coffee have been raised successfully in Java which are said to combine the good qualities of the two plants, and in one case it is claimed that when such a hybrid is grafted on Liberian roots the plant is resistant to coffee leaf disease. Hybrids between *C. liberica* and *C. robusta*, and between *C. congensis* and *C. liberica* have also been raised successfully in Java. A hybrid between "Bourbon" and "Maragogipe" has been produced at the Agricultural Institute of Sao Paulo, Brazil, which is said to possess the robustness and disease-resistant character of the latter variety combined with the productiveness of the former. It

has been found to retain these characters after several generations, and young plants have been distributed to a number of estates.

There is still room for considerable improvement in the coffee plant, especially in regard to regularity of yield, and this result is most likely to be achieved by hybridisation and subsequent careful selection.

Coffee Substitutes.—In addition to the true coffee plants, others whose seeds are roasted in the countries of origin as a substitute for coffee are often designated "coffee." Among these may be mentioned Kentucky "coffee" (*Gymnocladus canadensis*, Lam), and Negro "coffee" (*Cassia occidentalis*, L.), both belonging to the natural order Leguminosae, and Mussaenda "coffee" (*Gaetnera vaginata*, Lam.) which is related to true coffee, and is sometimes included in the same family. Numerous substances are employed for adulterating or mixing with coffee, chicory being largely used for the latter purpose in this country, while a number of "artificial" coffees have been placed on the market, especially in Germany and the United States. An account of the various adulterants and so-called substitutes is given in *Kaffee, Kaffeekonserven und Kaffeesurrogate*, by E. Franke. (Vienna 1907), and in Bulletins No. 13, Pt. 7, and No. 32. *Div. of Chem., U. S. Dept. Agric.*

Cultivation.

Climate.

The first consideration in selecting the site of a coffee plantation is the climate. The natural habitat of the various species of coffee, so far as this is known, is along water courses and in the partially wooded country which borders the forest areas of tropical Africa; that is to say, in situations where the atmosphere is more or less humid and the temperature fairly high. Both these conditions are essential for successful coffee cultivation, and it is necessary to consider them in some detail.

Temperature.—Speaking generally, coffee does best where the mean annual temperature is about 70° F., the mean minimum about 55° F., and the mean maximum about 80° F. At Braganca, one of the chief centres of coffee growing in the State of Sao Paulo, Brazil, the mean annual temperature is 66·9° F., the mean during the summer months 72° F., and during the winter 60·8° F.: the absolute maximum and minimum temperatures recorded during a period of 10 years were 99·7° F., and 32° F., respectively. In the coffee-growing region of Yemen, Arabia, the temperature varies from 57° to 79° F., during the day, falling to 72° during the night in summer; in winter it may fall as low as 28° or 30° F., on the summits. In Uganda, where coffee has been successfully grown in recent years, the mean maximum and minimum temperatures are 80° F., and 62° F., respectively, with only little variation during the year.

Rainfall.—In order that the humidity of the atmosphere may he maintained the rainfall must be moderately high and fairly evenly distributed throughout the year. Prolonged drought is fatal to the coffee plant, although it is an advantage if a dry season supervenes during the winter. These points are well brought out in the case of Braganca, where the mean rainfall during spring, summer, autumn and winter is 15·3, 25·5, 23·8 and 4·5 inches respectively, the total amount in the year being 69·1 inches. In Yemen the rainfall is somewhat irregular, but here also the heaviest rains fall during the summer, November to March being the driest season; the annual rainfall here varies from about 32 to 78 inches. If the rainfall is too heavy the plant is apt to make much growth at the expense of flowers and fruit, especially at low levels.—*Simmons' Spice Mill.*

(To be continued.)

HISTORY REPEATETH ITSELF.

The following is the translation of an inscription on a brick recently found in Mesopotamia :—

Now it came to pass in a gardenland,
Two headworkmen strove together,
But strictly in the spirit of abuse,
Lo! one crimped the underling of the other.
So the aggrieved (one) resorted to the cry of
Peh! Peh! Peh!
But the crimper heeded not.
The matter was referred to the Overlord of the garden,
Both parties to the dispute,
Together with the underling.
Belonging to the self same gardenland.
And the Overlord, after deeply considering,
Found it beyond his strength.
He referred them to the statutes of the land,
To the Magistrate afar off,
Who issued a warrant according to the Law,
Beloved of the Medes and Persians,
A warrant for the arrest of the underling,
Who stared them in the face in the garden,
Yet it could not be served.
The assistance of THE DEPARTMENT was sought,
Why else do I pay two diblets an hectare
Said the Overlord! Selah!
And the rest of the Acts of THE DEPARTMENT
Which it was expected to perform,
Are they not written in the Chronicle of Chronicles?

(Signed) AZIT TIGLATH MIPHANSI THE SCRIBE.

TEA.

Indian Tea.—During the week 55,000 packages have been offered at auction. The quality was poor, but on Monday there was a good demand for all kinds up to about 11*d* per lb. Over this price rates were somewhat easier. On Wednesday the demand was not so good, and there has been a considerable amount of irregularity, with generally lower prices for all grades except good liquoring Fannings, which were well supported. For next week about 50,000 packages are catalogued. The 20th sale of the season was held in Calcutta on Tuesday, when 35,000 packages were offered. The quality was irregular and the market rather firmer.

Ceylon Tea.—The smaller amount offered at the auctions on Tuesday last met with good support, and although there was some irregularity in the medium kinds there was practically no change. In Pekoes and Pekoe Souchongs the lowest grades remained firn, and all Teas up to about 10*d*. were readily taken at last week's rates. Broken Pekoes were in request, and recent values were generally maintained. At the public sales 31,318 packages were brought forward, of which about 1,100 were withdrawn.

China Tea.—There was a small auction on Wednesday, when about 400 packages of Kintucks, Keemuns and Green Teas were offered. A few of the parcels were attractive, and fetched fair prices, while the balance sold at late rates. The private market is steady, and a fair business has been done in common Monings from the lowest to about 10½*d*.—*The Produce Markets' Review.*

LABOUR DEPARTMENT.

(Camp) Srivilliputhur,
20th November, 1915.

S. CANARA DIVISION.—In future correspondence and accounts will be attended to by Messrs. Volkart Brothers, Coffee Curing Works, Mangalore, to whom Subscribers are requested to write on all matters concerning labour.

SRIVILLIPUTHUR DIVISION.—Mr. M. Clementson is now in permanent charge, and remains temporarily in charge of the Chingleput Division until a permanent Officer is appointed. The Director will also devote his personal attention to Chingleput and Trichinopoly to see the work does not suffer in the meantime.

AYLMER Ff. MARTIN,
Director.

CORRESPONDENCE.

WYNAAD PLANTERS' ASSOCIATION.

Meppadi, 20th November, 1915.

THE EDITOR,
The Planters' Chronicle.

W. P. A. Proceedings No. 1998.

Dear Sir,—With reference to Mr. T. S. Gillatt's offer of his "Humber" Motor Car to be raffled for in aid of the Madras War Fund, I have been requested to state that the Car is to be regarded as a gift to the Madras War Fund from *Mrs. Gillatt.*

In this connection also I would like to inform you that I have received the following telegram from the Military Secretary to the Governor of Madras:—

15th November, 1915.

"Madras Governor's Camp, Madras.

"To the Wynaad Planters' Association,
Meppadi.

"48/168. On behalf of His Excellency gladly accept generous offer Motor Car for raffle. Best opportunity for taking advantage of it would be Ladies' Department Union Jack Fête end next week. If this is convenient and agreeable to you could you send Car to me not later than Thursday 25th.

MILITARY SECRETARY."

The Car has been sent to the Military Secretary to-day (20th instant).

Yours faithfully,
N. C. WHITTON,
Honorary Secretary.

EXTRACT FROM THE "MORNING POST" OF OCTOBER 11TH.

8739 Private G. Howe, 2nd Battalion Royal West Kent Regiment received the Distinguished Conduct Medal on October 11th for conspicuous gallantry on July 24th, 1915 near Nasiriyah, Mesopotamia. Private Howe went to the assistance of Lieut. A. L. Hill who was wounded and engaging the enemy with his sword, he bayonetted 4 and shot 1 thereby saving the officer's life.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 49.] DECEMBER 4, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED)

Contents.

The first meeting of the South India Branch of the Rubber Growers' Association will take place at Quilon on the 11th instant. The Secretary, U. P. A S. I., who will attend, expresses a wish that members of District Associations will refrain from writing to him or sending money between the 8th and 15th instant, or having written, will kindly accept, in advance, his apology for belated replies.

The Honorary Secretary, Mundakayam Planters' Association, writes us "Mr. Gilbert, who was on Cheruvaley Estate for a short time and who returned home on the outbreak of hostilities, is reported to have been wounded."

We should feel so much obliged if any information respecting the members of District Associations who have joined His Majesty's Forces was sent to us for publication. Such news is of keen and general interest to all the planting community.

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously subscribed	24,434	0	0
Mr. Edward Lord	500	0	0
Mr. D. V. Crowe (September)	7	8	0
Mr. C. Fraser (November)	20	0	0
Mr. A. Blair Hill	20	0	0
Mr. E. A. Cheesman	25	0	0
Mr. T. S. Dobree	10	0	0
Mr. F. Bell	50	0	0
Messrs. Aspinwall & Co., Ltd.	500	0	0
Mrs. J. G. Hamilton (2nd Contribution) ...	60	0	0
Total Rs...	25,626	8	0

OVERSEAS AIRCRAFT FUND.

Amount previously subscribed	3,923	14	0
Mr. C. Fraser	50	0	0
Mr. A. Blair Hill	20	0	0
Rev. W. Bateman	15	0	0
Total Rs...	4,008	14	0

DISTRICT PLANTERS' ASSOCIATIONS.

Anamalai Planters' Association.

Minutes of an Extraordinary General Meeting held at the Club at 2 p.m., on September 15th, 1915.

PRESENT.—Messrs. Congreve (Chairman), Hatton Robinson, Lloyd, Behr, Moxon, Jones, Robb, Cooper, House, Carless, Simcock and Cotton (Honorary Secretary) *Visitor* :—E. H. F. Day, Esq.

The minutes of the last meeting were read and confirmed and it was decided to send a reminder to the D. P. W. regarding the condition of the roads and other matters referred to the Association's letter of July 9th.

MINOR FOREST PRODUCE.—The Honorary Secretary was instructed to write to the Collector and District Forest Officer asking that in future all correspondence should be sent to Mr. J. Carless, Mukottumudi Estate.

HOSPITAL SITE.—The Honorary Secretary was instructed to address the Collector again with reference to the deduction of the area of road in payment for the felling.

MEDICAL AFFAIRS.—It was decided to address the District Medical Officer, with a view to ascertaining the qualifications, terms of service, &c., of the present Sub-Assistant Surgeon, giving details of a serious case occurring on the 14th instant with which he was incapable of dealing.

It was also decided to enquire of the P. W. D. the reason of delay in construction of the hospital and the date by which it may be expected to be open.

BANGALORE DELEGATES' REPORT.—Scientific Department. It was proposed by Mr. Congreve and seconded by Mr. Robb that Messrs. Robinson, Simcock and Cotton form a Committee to address the U. P. A. S. I. on the subject of the treatment of this Association in this connection.

The delegates' report was read and adopted for private circulation and a vote of thanks passed to the delegates. It was resolved to allot Rs. 300 towards the delegates expenses to Bangalore.

DISTRICT ADVERTISEMENT.—The Honorary Secretary was instructed to obtain tenders for the taking of suitable photographs, working in connection with Labour Department, each estate to choose what photos it wants taken and all photos to be submitted to the Labour Committee for selection.

WESTERN OUTLET.—Read the Cochin Dewan's letter of 28th July and reply to same. It was decided to send a reminder on the subject.

POST AND TELEGRAPH.—It was decided to ask the Postmaster-General the reason of delay in construction stating that temporary quarters may be provided immediately on the present site at Valparai, conditionally upon the removal of the wire to the new site as soon as the new building is completed, and reminding him that the Telegraph guarantee has now been in his hands for some months. It was also decided to send a copy of the letter to the Postmaster-General, to the Planting Member.

S. I. P. WAR FUND.—The Honorary Secretary was instructed to write to the Secretary, U. P. A. S. I. for more circulars. At the meeting a sum of Rs. 750 in donations and monthly payment amounting to Rs. 65 per month to the end of the war was promised.

POLLACHI TRAVELLERS' BUNGALOW.—The state of the Pollachi Travellers' Bungalow having been discussed, it was proposed by Mr. Robb and seconded by Mr. Carless that the Local Board's attention be drawn to

the fact that the Local Fund Travellers' Bungalow in Pollachi is in a disgraceful condition as regards cleanliness and furniture and that as it is a first class Bungalow the Board be requested to put matters right immediately and provide an adequate supply of furniture and other necessaries, and to suggest to the Board that as planters from this District are constant users of this Bungalow their comfort might reasonably be studied in the above respects.

GHAUT ROAD.—It was decided to address the D. P. W. again on this subject.

NEW MEMBERS.—The following new Members were elected :—

Mr. C. K. Pittock proposed by Mr. J. H. Robinson, seconded by Mr. Congreve

„ J. R. Moxom „ „ A. A. Robb „ Mr. House

„ R. H. Ferguson „ „ Carless „ „ Scott

LOCAL LABOUR LAWS.—The existing Labour Laws were discussed and it was resolved that they should be properly tabulated ; and that the advice of other Associations be asked on the subject.

CONTINUANCE OF THE A. P. A. OR OTHERWISE.—It was proposed by Mr. Simcock and seconded by Mr. Robb that the A. P. A. employ a short-hand Typist Clerk capable of undertaking the correspondence of A. P. A, under the guidance of the Honorary Secretary and that the members of the Anamalai Club be approached as to whether they should contribute a share of his salary in return for his services as club writer. A vote of thanks was passed to Mr. Simcock for his offer of a house for the clerk.

LABOUR LAWS.—Resolved that an Extraordinary General Meeting be called within a month from this date to discuss rates of pay. It was proposed from the Chair and seconded by Mr. Simcock "that the rate of pay current in the district to be binding on all members of the A. P. A. shall be as. 5 per man and 3½ per woman for all contracts to work after 1st April 1916 and that advances be limited to Rs. 10 per head for Tamil coolies, provided that the Mundakayam Planters' Association will agree to reduce their present rates similarly."

With a vote of thanks to the Chair the meeting closed.

(Signed) C. R. T. CONGREVE,
Chairman.

(„) A. C. COTTON,
Hon. Secretary.

Anamalai Planters Association.

Minutes of an Extraordinary Meeting of A. P. A. held at the Club at 2-30 p.m., on 15th October, 1915.

PRESENT.—Messrs. Robb, Robinson, Congreve, Scott, House, Jones, Simcock, Behr, Ferguson, J. O. K. Walsh, H. O. D. Walsh and Cotton.

VALPARAI POST OFFICE.—It was decided to address the Postmaster-General with a view to the acceleration of the Mail which at present takes from 10-30 a.m. to 2 p.m. on the following day, or a period of over 27 hours to cover under 40 miles and also to enquire of the Postmaster-General the reason of delay in construction of the Telegraph line from Pollachi, as it is now 8 months since the department of the Telegraph Office was guaranteed and the guarantee accepted. Copies of these letters to be sent to Planting Member.

MEDICAL AFFAIRS.—The Honorary Secretary was requested to address the District Medical Officer, Coimbatore, on the subject of the capabilities and charges of the Sub-Assistant Surgeon at present posted to the District and to ask for a definite ruling on the question of whether the officer in charge of the Local Fund Hospital in bound to attend cases at a distance when sent for and whether he is permitted to charge what fees he likes for attendance.

WESTERN OUTLET.—Read letter from the Dewan of Cochin. It was decided to ask the Dewan to receive a deputation composed of Messrs. Robinson, Simcock, Congreve and Scott on the subject and to request the Planting Member also to attend if possible.

A. P. A. SUBSCRIPTION FOR THE CLUB.—Proposed by Mr. Simcock and seconded by Mr. Robinson that the A. P. A. pay a monthly rent of Rs.5 to the Club for the use of the Club buildings at all A. P. A. Meetings.

LABOUR MATTERS.—The resolution of the last meeting was discussed but not confirmed.

Mr. Behr's resolution on the subject was discussed but not carried.

A. P. A. FINANCES.—All members present agreed that they are still liable for 1915 to 16 subscriptions.

DISTRICT ADVERTISEMENT.—Correspondence read and recorded. With a vote of thanks to the Chair the meeting terminated.

(Signed) A. C. COTTON,
Honorary Secretary.

CEYLON.

PRINCIPAL CROPS IN 1914.

According to the Report on Ceylon for 1914, recently issued by the Colonial Office (*Annual Series*— No. 855), the principal agricultural crops of the Colony—paddy, tea, rubber coconuts and cinnamon—continued to flourish.

The price of copra, which had fallen on the declaration of war, rose rapidly at the end of 1914, and, despite the fact that the largest local buyers were German firms, whose businesses were put in the hands of controllers, there has been no lack of markets and there is every prospect of new and important markets being opened up by the war. The value of the exports of copra amounted to 2,32,00,000 rupees as compared with 2,09,00,000 rupees in 1913.

As regards rubber, the outlook was uncertain during the latter part of the year, but the fears of a serious slump were not realised. The standard of cultivation improved. Exports of rubber in 1914 amounted in value to 5,72,00,000 rupees as against 6,12,00,000 rupees in 1913.

The output of tea in 1914 was in excess of that of the preceding year and prices have been maintained at a high level. The value of tea exports increased from 8,77,00,000 rupees in 1913 to 8,97,00,000 rupees in 1914.

Rupee = 1*s.* 4*d.* at par.

—*The Board of Trade Journal.*

TEA.

China Tea.

The following note on the Tea trade during 1914 appears in the *Consular Report on the Trade of Foochow*.

The condition of the principal consuming markets early in the year was much more favourable to a satisfactory opening here than had been the case for several seasons past, but it soon became apparent, after new teas began to arrive, that the grades most in demand on the home markets were in unusually short supply, and the scramble which took place for the early arrivals turned what would have otherwise been a healthy market, from which all would have derived satisfaction, to one fraught with great anxiety to all except German interests, which dominated the market throughout, and those of the native teamen who were able to dispose of their produce at ever-increasing rates. This condition continued up to the declaration of hostilities in Europe, since when German firms have made no purchases.

During August practically no business was done, and only a comparatively small proportion of the teas on hand when war broke out could be shipped off that month. Early in September, however, the consuming markets began to recover from the first effects of the war, and the revival which began then to take place enabled British firms to accelerate the shipment of their accumulated stocks, so that by the end of that month the situation was as satisfactory as could be expected in the circumstances. Early in October the shortage of common teas at home began to be felt, and large shipments were made from here to London during that month, the market being practically cleared of all suitable tea by the end of November. The bulk of these shipments were still on the water when the embargo on the export of tea from the United Kingdom to the Netherlands and other Continental countries was imposed by the Government, and whilst a few parcels realised good prices, the bulk of the teas arrived on a more or less dead market. With the partial removal, however, of the embargo, the situation improved, and a revival in values took place.

The increase of the duty at home has had the effect of creating a greater demand for low price tea, such as can only be supplied by China; and this enabled a steady business to be done with London throughout the winter, later shipments consisting almost entirely of Oolong, of which, under ordinary conditions, only a comparatively small quantity finds its way there.

Freight rates have been substantially increased, and any further advance is likely seriously to interfere with future business.

Since the turn of the year only Oolong has been obtainable, the market having been cleared of all Congous and Soochongs before Christmas.

The business with Bombay and Persian Gulf ports was very active early in the season, but died down quickly after the departure of the first steamer, and did not revive until towards the end of the year.

An increased consumption of tea generally is looked for next season, particularly in Russia, and it is hoped that this may to some extent counterbalance the losses of the German and Austro-Hungarian markets, the former of which has been Foochow's mainstay for many years past.

On the prospects of the Foochow tea trade for 1915 opinions seem to differ. At the date of writing this report, the end of March, practically all the tea left unsold at the close of 1914 has been bought up and exported, so that when the new season opens in May, there should be little or none of the last year's stocks remaining on the market. In this respect, therefore, the position is good. The fall in exchange is also in favour of the local product as is the closing of the Russian Black Sea ports, which should give a fillip to the trade via Vladivostok, to supply which China is in a more favourable position than her competitors. It is expected, too, that there will be larger consumption than usual in Russia, and there seems no reason why the increased demand for low priced teas in the United Kingdom, consequent on the increase in the duty, should not continue. In spite, therefore, of the loss of the German and Austro-Hungarian markets, the position from the point of view of the British tea merchant in Foochow is not without its bright side.

The export of tea to Chinese ports for the first time on record has exceeded that to foreign countries. The quantity 142,665 piculs, valued at 3,682,849 taels, is a record for the trade, though, as in the case of the foreign export, the decline in the value indicates that the average quality of the tea was lower than in 1913.

It is pleasant to record that both the Central Government and the provincial authorities seemed to have wakened up at last to the importance of encouraging the tea industry in China. The former have lowered the export duty from 1 tael 25 c. to 1 tael per picul, while the latter are endeavouring by proclamations and other means to impress upon the producers the necessity of giving greater care to the cultivation of their crops and of avoiding adulteration, inferior packing and other malpractices, which are earning a bad name for the local product.

BRITISH INDIA.

Tea Cultivation in Assam in 1914.

The Report by the Director of Land Records and Agriculture in Assam on tea culture in that Province in 1914 states that the total number of gardens in Assam increased from 752 to 762. Two new gardens were opened in the Karimganj sub-division of the Sylhet district, while two fibre gardens in the South Sylhet sub-division were converted into tea gardens. Three new gardens were opened in the Lakhimpur district, and the Sibsagar district shows an increase of three gardens. The total area under tea increased from 367,847 acres in 1913 to 376,048 acres, while the area plucked was 351,113 acres.

The 1914 crop amounted to 208,227,104 lbs. of manufactured tea, of which 208,012 581 lbs. were black and 214,523 lbs. green. The total output of the Province was about 4 per cent. more than that of the preceding year. The production of green tea was, as in previous years, practically confined to the Surma Valley. In Cachar the quantity of green tea manufactured during the year was reduced by 252,355 lbs., while in Sylhet it rose from 333 lbs. to 134,513 lbs. Why there was a large decrease in one district and an increase in the other is not quite clear. It may be observed that the total production of this kind of tea for the Province has been falling off for several years past and the demand seems less than it was.—*The Board of Trade Journal.*

COFFEE.

The Cultivation and Preparation of Coffee.

AN INTERESTING REVIEW OF THE SUBJECT OF CULTIVATION, PREPARATION AND CONSUMPTION OF COFFEE.

(Continued).

Altitude.—Coffee, particularly the Arabian variety, requires an open and bracing climate and a clear sky. For this reason it grows best at fairly high altitudes, the actual height being determined to a large extent by the latitude. At lower levels, if the atmosphere is damp, Arabian coffee is very liable to disease, and at such places Liberian coffee succeeds best. The finest-flavoured coffee is, as a rule, grown at the highest altitudes, where the climate is usually drier, but the yield and the size of the fruit are correspondingly decreased. The chief coffee-growing districts of Brazil are situated on plateaux seldom less than 1,800 ft. high, while in Arabia the plantations are situated at altitudes varying from 3,500 to 6,000 ft.

Wind Belts.—Strong winds are very detrimental to coffee, even more than a dry atmosphere or low rainfall. Localities subject to violent winds should therefore be avoided, but even in other places it is often advisable to plant wind-belts to protect the plants. The trees selected for the purpose should be strong and densely branched. They may be planted close together and thinned out when necessary. The following have been recommended as forming good wind-belts: *Markhamia platycalyx*, *Ficus* spp., conifers, jak fruit (*Artocarpus integrifolia*), mango (*Mangifera indica*).

Shade Trees.—Closely connected with the climatic conditions is the question of shade for the mature plant. Whether this is necessary or not has been much discussed, but the general conclusion reached is that it depends entirely on the local conditions, and each planter must decide the matter for himself either by studying the results obtained on neighbouring plantations or by actual experiment. In certain regions, such as parts of Arabia and Mexico, which are comparatively arid, shade is necessary to prevent desiccation of the surface soil and to maintain a humid atmosphere. In other countries, however, it may not be merely unnecessary, but even harmful, the atmosphere being thereby made too damp, and consequently favouring the development of fungoid disease, inducing rank growth, and perhaps spoiling the flavour of the product. In Central America and the northern States of South America, where shading is much in vogue, the trees mainly employed belong to the Leguminosae, and it has been suggested that any good results which may be obtained through having such trees on the plantation are due not so much to the shade produced as to the enrichment of the soil by these plants. For a full discussion of the question of shade, O. F. Cook's "Shade in Coffee Culture" (*Bulletin* No. 25, 1901, *Div of Botany*, U. S. Dept. Agric.) may be consulted.

As a general rule shade is necessary for the seedlings in the nursery and for newly planted bushes, a point which will be considered further when dealing with the propagation and transplanting of coffee, but in certain countries, *e. g.* parts of Uganda coffee has been raised from seed, transplated, and brought to maturity without shade of any kind.

If shade trees are employed in the plantation much care should be taken in their selection. Those with a fairly high crown, and which do not cast a deep shade, are preferable, the best being leguminous trees. O. F. Cook (*loc. cit.*) gives a very complete list of trees which have been used or recommended for the purpose, among the more important being *Erythrina*

spp., *Pithecolobium Saman*, *P. dulce*, *Inga* spp. *Albizzia Lebbek*, *A. moluccana*, and *Gliricidia maculata*, all leguminous plants; and *Artocarpus integrifolia*, *Mangifera indica*, *Persea gratissima*, *Musa* spp. (banana and plantain), *Hevea brasiliensis* and *Castilloa elastica*, all of which yield products of economic value, and may thus form an additional source of revenue. In Java *Leucaena glauca* is much in favour as a shade tree, and for this purpose appears to be replacing *Erythrina* and *Albizzia*.

Soil and Situation.

To obtain the best results the coffee plant requires a rich, deep, well-drained soil, rich in humus. Stagnant water is fatal to the plant. The most suitable situation for a plantation, therefore, is on gently undulating land possessing a loamy soil overlying a porous subsoil. Heavy clays, light sands, or very chalky soils should be avoided; on slightly sandy soil good results may be obtained, provided it is rich in humus, so that plenty of moisture is retained, or as long as the rainfall is heavy and fairly evenly distributed throughout the year. Rocky soils with pockets of rich soil are, perhaps, the most suitable, since, although they may present some difficulties to lining and holding, they are generally well drained and cool, and the rocks themselves form an almost inexhaustible reserve of food which is continually becoming available to the plants by the action of the weather. Some of the best coffee produced in Arabia, Java, India and elsewhere is grown on soils of this type.

A good indication of the fertility of the soil may be obtained from a study of the indigenous vegetation. The presence of tall, straight trees implies as a rule a deep, rich soil with an ample water supply; on steep slopes, however, the soil, although still rich, is sometimes thin, owing to denudation by heavy rains. Land bearing short grass with only occasional scrub or low trees should be avoided. In Uganda the presence of a high "Elephant grass" is said to indicate a deep, rich soil, well drained.

On steep land trenches must be made across the slope to check erosion and to retain the water, while on wet lands drains must be cut. The latter should be about 15 to 18 in. wide and deep, about 50 ft. apart, and have a fall of about 1 in. in 12 or 1 in. in 16, according to the nature of the ground.

Although the soil itself must be well drained, it is imperative that the plantation should be formed close to an abundant and permanent water supply, since large quantities of water are required in the preparation of the coffee for the market, and are usually necessary for watering the seed beds and the young plants in the nursery.

Propagation.

On a commercial scale coffee is almost invariably raised from seed; cutting root readily, but this method is only possible on a small scale, while in certain cases grafting has been employed. The practice which is sometimes followed of planting an estate with seedlings which spring up round mature trees rarely gives good results. Such plants are never uniform in size, their roots are frequently malformed, and the planter has no control over the quality of the product. The purchasing of young plants is also to be condemned, unless they come from an absolutely reliable source. Without question the best results are obtained by raising the plants from seed.

The seeds are most commonly sown in nurseries, but sometimes they are planted at stake. In the latter case three or four seeds are sown together on specially prepared mounds of soil in the situation where the

adult plant is to grow. After germination all but the strongest plant on each mound are pulled up. This method is only practicable where there is no chance of drought at the sowing season.

Preparation of Nursery.—The first consideration in the formation of a plantation is to select the site of the nursery. If the area to be planted is large, it is preferable to form several nurseries in different parts of the estate, so that the young plants when ready to be removed may be transplanted as rapidly as possible. The soil should be the best on the estate, rich, porous, containing plenty of humus, and situated on a gentle slope close to a good water supply. Any forest trees in the neighborhood of the nurseries may be left, as they will provide shade and shelter, but they should not be allowed to overhang the seed beds.

The seed beds should not exceed 5 ft. in width, so that they can be readily tended, and should be separated from each other by a trench about 9 in. deep and 18 in. wide, which acts both as a path and as a drain. A deeper trench should be made along the top of the beds to prevent any danger of surface wash. The soil must be thoroughly well tilled, all stones and roots removed, and the surface reduced to a fine state of tilth before the seeds are sown. It is better not to add manure, except in the case of poor soils, which of course will not be selected if better are available, but sand may be added to advantage to make the soil more open.

Selectio and Sowing of Seed.—The seed used for sowing should be obtained only from specially selected plants. Bushes about eight years old, in full bearing, yield the best seed, and care should be taken to see that they give a regular and large yield of the finest quality coffee. The largest fruits, situated about in the middle of the branches and half way up the bush, should be selected and allowed to become perfectly ripe before being picked. The pulp is removed by hand, but the parchment should not be broken. If the seeds cannot be sown at once, they must be carefully and slowly dried in the shade to prevent them from shrinking, and then packed thinly in layers between sand in a wooden box and stored in a cool place shaded from the sun. Seeds may be safely kept in this way for several months.

The most suitable time for sowing is the beginning of the rainy season. In some cases the seeds are placed about 6 inches apart in rows; and the seedlings left in position until they are ready to be moved to the plantation. More usually, however, they are sown thicker than this, and the seedlings pricked out into specially prepared beds. In the latter case drills are made about 7 or 8 inches apart, and about 1½ inch deep, running down the length of the beds. If the soil is not sufficiently good about ½ inch of fine soil is put in the drills and the seeds are then planted by hand, convex side uppermost, and about 1 inch apart. The drill is then filled in with fine soil which is pressed firmly down. Sometimes two or three grains of wheat, maize or other cereal are sown at intervals along the drill; these germinate before the coffee and serve to indicate the position of the drill and so enable watering to be more efficiently carried out and weeding to be performed without injury to the coffee seeds.

The quantity of seed sown should be more than sufficient to supply the immediate requirements of the plantation, since gaps will require to be filled up, and some allowance must be made for failures in germination. As a guide to those who have to purchase the seed it may be mentioned that there are roughly 2,509 coffee seeds to the pound.—*Simmons' Spice Mill.*

(To be continued.)

CORRESPONDENCE.

Calicut, 25th November, 1915.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—With reference to the prohibition of export of Coffee from the United Kingdom which is having such a depressing effect on the coffee market and which, unless removed, is likely to interfere seriously with the sale of the East India crop which is now being picked, we send you herewith a copy of a letter which has been addressed to the British Government by a Committee representative of the Coffee Trade in London.

Yours faithfully,
For Peirce, Leslie & Co., Limited,
J. CHRISTIE,
Director.

(ENCLOSURE.)

Final Draft letters as received by the Committee on 27th October, 1915.

1. Sir,—I am desired to inform you that at a Committee meeting representing the undermentioned bankers, merchants and traders held at the offices of this Chamber on the 27th instant the following resolution, relative to the prohibition of the export of Coffee to Neutral Countries in Europe, was unanimously adopted:—

"That this meeting of bankers, merchants and traders, while anxious to support the Government in every possible way in the prosecution of the war, are forced to the conclusion, from facts within their own knowledge, that the prohibition of the export of Coffee from the United Kingdom to Neutral Countries (which Countries it nevertheless reaches by direct shipment from the country of production, or *via* New York) is absolutely detrimental to British interests without effecting its object of preventing the importation of coffee into Germany; and therefore desire in the interests of the export trade of this country that H. M.'s Government should consider the advisability of removing coffee from the list of prohibited exports.

"That copies of this resolution be sent to the Prime Minister; the Secretary of State for Foreign Affairs; the Chancellor of the Exchequer; the President of the Board of Trade: the Chairman of the War Trade Department; the Secretary of State for India, and the Liverpool, Manchester and Glasgow Chambers of Commerce."

2. In presenting this resolution for your consideration we should like to be allowed to add the following remarks:—

3. From the figures of the importation of Coffee into Holland and the Scandinavian Countries since the beginning of the War we think there can be no doubt that there is some leakage from those countries into Germany, even allowing for what we believe to be the fact that, before the war, both Holland and Scandinavia used to supply themselves largely through Hamburg which they are now no longer able to do. But, even admitting this to be the case, it does not appear, so far as we are able to judge, that the continued prohibition of the export of Coffee from London to neutral countries whilst it undoubtedly entails considerable loss upon those who may be holding or financing it here secures a commensurate advantage for the policy which it represents.

4. We hope that, after the war, London may become a more important centre for the distribution of Coffee to other countries than it has been hitherto and it would be a misfortune if the effect of this prohibition of export should result in reducing the importance of London in the entrepot trade by diverting coffee to other centres.

5. We would suggest that the withdrawal of the prohibition of export (which we should naturally wish only to take place under all proper safeguards) would, to some extent at any rate, be a factor in helping to make the rates of foreign exchange less unfavourable to this country than they are now, which, in the present financial situation, is a result much to be desired.

6. The matter is now one of urgency in view of the new crop of coffee, which promises to be a heavy one, and it is hoped that His Majesty's Government may be disposed to receive a small deputation at an early date in support of the above representations, and to afford any further information that may be desired on this matter.

I am, Sir,
Yours faithfully,
ROBERT BROWNE,
Chairman of the Meeting, Secretary.

LIST OF COMMITTEE.

R. Arbuthnot, Arbuthnot Latham & Co., 33, Gt. Tower St. E. C.
Robert Browne, Carey & Browne, 36, Mincing Lane, E.C.
Andrew Devitt, Lewis & Peat, 6, Mincing Lane. E. C.
D. S. Gilkison, Peirce, Leslie & Co. Ltd., 14, Billiter Street.
Wm. Gillespie, Gillespie Bros. & Co., 82, Fenchurch St. E. C.
Henry J. Glanville, Pinto Leite & Nephews, 45, Moorgate St. E. C.
W. H. Goschen, Fruhling & Goschen, 12, Austin Friars.
C. S. S. Guthrie, Ghalmers Guthrie & Co., 9, Idol Lane, E. C.
Percy G. Harrison, Wm. Le Lacheur & Son, 58, Lombard St. E. C.
G. E. Humphrey, Hays Wharf, 55, Gt. Tower St. E. C.
F. Huth Jackson, Fredk. Huth & Co., 12, Yokenhouse Yd.
E. E. Johnston, E. Johnston Son & Co., 6, Gt. St. Helens, E. C.
M. Mackenzie, J. H. Allen, & Co., 41, Gt. Tower St. E. C.
Lionel A. Martin, Henry Tate & Son, Ltd., 21, Mincing Lane, E. C.
Sir Owen Philipps, K. C. M. G., Royal Mail Steam Packet, 18, Moorgate, St. E. C.
Sir Ed. Rosling, Anglo-Ceylon & General Estates Co., 20, East Cheap, E. C.
G. A. Walder, P. R. Buchanan & Sons, 15, Lendenhall St.
C. Woodhouse, C & M. Woodhouse, 37, Mincing Lane.

Yercaud, 26th November, 1915.

THE SOUTH INDIA PLANTERS' BENEVOLENT FUND AND THE U. P. A. S. I. ACCOUNTS.

THE EDITOR,
Planters' Chronicle.

Dear Sir,—The S. I. Planters' Benevolent Fund is a separate fund to the U. P. A. S. I. and on a question of form I should be interested to hear the views of planters generally on the practice adopted in the accounts of the U. P. A. S. I. of including the balance of the Bank account in respect of the S. I. P. Benevolent Fund in the General Balance Sheet.

It seems to me as if this practice is incorrect as the two accounts should not be mixed up.

It it be contended that there is no objection to the practice, then surely the amount which stands invested in Government Paper on behalf of the Fund (I believe it is Rs. 17,000) should also be included at cost.

To include one and not the other is apt to be misleading, for in the General Balance Sheet as at 30th June, 1915 a sum of Rs. 2,682-1-6, the balance of the current banking account, is shown and it might be taken as the *only* funds of the Benevolent Fund, whereas an investment of Rs.17,000 (or whatever the amount is) exists but is not shown.

Would it not be better to exclude the Benevolent Fund accounts altogether from the U. P. A. S. I. accounts and have a separate statement drawn up yearly something in the following form?

SOUTH INDIA PLANTERS' BENEVOLENT FUND.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 30TH JUNE, 1915.

Dr.	Rs.	A.	P.		Rs.	A.	P.	*Cr.*
To Relief granted ...	1,460	0	0	By Subscriptions ...	1,955	0	0	
„ Current expenses...	55	11	0	„ Interest ...	631	4	4	
„ Advance written off.	100	8	0					
„ Profit for year ...	970	1	4					
Rs...	2,586	4	4	Rs. ...	2,586	4	4	

BALANCE SHEET—AT 30TH JUNE, 1915.

Dr.	Rs.	A.	P.		Rs.	A.	P.	*Cr.*
To Income & Expenditure Account.				By Investments at Cost.				
Surplus at 30th June, 1914 ..	18,189	7	4	Rs. 17,000, 3½ G. P...	16,477	7	2	
Add profit for the year ended 30th June, 1915 ...	970	1	4	„ Cash at Bankers ...	2,682	1	6	
Rs. ...	19,159	8	8	Rs. ...	19,159	8	8	

The Investment figures are not to be taken as the correct ones as I do not know what they are (not having the Benevolent Fund Report with me) but only as an example.

If the accounts be kept on this system the Income and Expenditure account should be credited with all subscriptions due for the period covered by the account whether received or not. Any subscriptions due but unpaid would appear in the Balance sheet as an asset.

Yours faithfully,

GUY TURNER.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 50.] DECEMBER 11, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert returned to Head Quarters on 9th December after making a tour in the districts of Malabar, Mundakayam, and Peermade. Mr. Anstead will probably be leaving again on tour next week.

Mr. Viswanatha Iyer, F. C. S. from the Scientific Department of the Indian Tea Association has been appointed Assistant Chemist in the Planting Expert's Laboratory at Bangalore and takes up his appointment and duties from 10th December.

We wish to correct a mistake made in the *Chronicle* of 16th October where we had stated that Mr. Hodgson commanded the *Deal* V. T. C. but he has written to point out that this should read that he commands the "Local" (*i.e.*, Exmouth) V. T. C. instead of Deal.

We publish an article by Mr. Guy Turner on Cash versus Revenue Basis of drawing up monthly Estate Accounts and Cost Accounts.

The Director of the Labour Department contributes an article on Coolie recruiting, the kernel of which lies in the words "The foundation of a successful labour connection is the family or patriarchal idea."

The Director of the Labour Department requests us to inform subscribers that his address will be c/o Post Master, Chingleput, from now till 10th January. Correspondence should be addressed accordingly. After that date till the last week in January, the Director will be much on the move and correspondence of Labour matters should be addressed to Bangalore after the 10th January.

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously acknowledged	25,626	8	0
Mr. R. F. Vinen	50	0	0
„ G. R. Oliver	300	0	0
„ Stephen Bayley (December)	10	0	0
Total Rs...	25,986	8	0

LABOUR MARKET.

The Labour Market in the United Kingdom in August.

According to a report in the September issue of the "Board of Trade Labour Gazette," the demand in August for male labour, both of men and boys, continued to be greater than the supply, especially in those trades engaged in manufacturing war requirments, with the rusult that there was very little unemployment. A considerable re-distribution was going on as between trades differently affected by the war, and to a growing extent female labour continued to supply the deficiency created by enlistments.

As compared with August, 1914, when many trades were for a short time disorganised by the outbreak of war, employment showed a very marked general improvement.

The coal mining industry was very busy, and the avereage weekly number of days on which the pits worked was the highest recorded for any August in the last twenty years. Employment continued good at iron and lead mines, and very good at shale mines, it was dull at tin mines. At slate quarries some improvement was reported; at other quarries employment was fairly good.

Employment was good in the pig-iron industry and there was a slight increase in the number of furnaces in blast. Iron and steel works continued very busy, and there was no abatement of the abnormal activity in the engineering and shipbuilding trades. The tinplate trade showed little change, but the steel sheet mills were rather better employed than in July. The other metal trades were very busy, especially on Government orders.

The cotton trade showed little change on the whole, an improvement in the spinning branch being counterbalanced by a decline in the weaving section. The woollen, worsted and hosiery trades continued very active, with much overtime, both on Government and ordinary work. Employment in the linen trade improved, but was still very slack in Ireland; in the jute trade it continued good, with overtime on war contracts. The fancy lace trade remained slack, but in the curtain branch it was fair, and in the plain net section good. There was a slight improvement in the silk trade, and the carpet trade continued fairly well employed. In the dyeing industry employment continued good and in the bleaching and calico printing trades fair.

The boot and shoe trades were very active, partly owing to war work and partly to arrears on private work. The leather trades were also well employed; workpeople in branches formerly slack have now been transferred to work on war contracts. There was a further seasonal decline in the dressmaking and millinery trades and in the bespoke tailoring trade. The ready-made clothing trade was still very busy, but the extreme pressure of recent months was somewhat reduced. In the felt hat trade and the mantle, costume and blouse trades an improvement was reported.

Building operations continued to be restricted, but the number unemployed in this industry was still very low owing to enlistments and transfers to other trades.

There was little change in the brickmaking industry, and employment in the cement trades continued good. The furnishing trades declined slightly, but employment with sawmillers, coachbuilders and coopers was good. It was also good with packing case makers and with brush-makers, both of which trades were busy on Government orders.

Employment with paper makers, and with bookbinders in London, showed a further improvement. It continued fairly good with lithographic printers; with letterpress printers, however, there was some decline.

The glass and pottery trades continued to be well employed on the whole. The food preparation trades were very busy, with much overtime. The fishing trade was much restricted by the war, but the men usually engaged found other work. In agriculture harvest operations were successfully carried on, the shortage of male labour being met by the employment of women and soldiers.

Dock labourers continued very busy, except at certain ports on the East Coast, and supply of seamen for mercantile vessels, for the first time for some months, was about equal to the demand.—*The Board of Trade Journal.*

COFFEE.

Wild Coffee in Abyssinia.

Coffee occurs in three main regions in Abyssinia, *viz.*, in the East, in the South, and in the West, over which the climate is practically the same.

In the East, round the old Egyptian garrison town of Harrar, there are a few plantations established by Europeans, but the bulk of the coffee comes from bushes growing wild. The coffee bush in this region grows at an elevation of between 3,000 and 4,000 feet.

In the South, in the Arussi and Jimma districts, the coffee is uncultivated; it is found at an elevation of about 5,000 feet.

In the West, on the Western margin of the plateau, coffee occurs abundantly at an elevation of 6,000 feet.

There are no meteorological records obtainable for Abyssinia: outside the usual rain-gauge and thermometer found in the compounds of European houses in Adis Abeba the capital, there are no instruments in the whole country. The rainy season lasts from June to September, and in intensity rivals the South-west monsoon in Ceylon. October to March is the dry season; April and May are showery. Abyssinia forms part of the East African plateau; Southern Abyssinia is built up of igneous rocks, whose decomposition has yielded a rich laterite soil.

The coffee bushes occur in open part country, amongst tall trees, mostly evergreens, under whose shade the coffee bushes are most numerous. The soil is covered with grass in open spaces, where the coffee bushes are wanting, and affords good grazing for cattle.

The coffee crop is the monopoly of the Abyssinian Government, who sell it to Greek traders. These latter buy at about 2½-Maria Theresa dollars per frasula of 37½ lbs. this is equivalent to £0·14s. 0d. per hunderweight.

The coflee crop from the Eastern side is exported through the French port of Dijibouti, and put on the market at Mocha as "Long Berry Mocha."

The Western crop was formerly shipped down the River Sobat and River Nile to Khartoum and thence exported to Europe through Port Soudan. Merchants found, however, that they could obtain a good price in the local market at Khartoum and the Abyssinian coffee is now ousting Brazilian coffee. The Abyssinian bean seems to make a more oily coffee, which is preferred by the natives to the coffee made from the Brazilian bean.—G. Bryce.—*The Tropical Agriculturist.*

CASH versus REVENUE.

Cash versus Revenue basis of drawing up monthly Estate Accounts, and Cost Accounts.

By Guy Turner, Yercaud.

If monthly Estate Returns are to be of value they should be kept upon the principle of expenditure incurred and not upon cash expenditure.

Returns kept upon a cash basis are misleading, for, being as they are only a summary of the Cash Account, they do not take into account any expenditure that may have been incurred and not paid for in the month. They may include cash advances given in respect of work to be performed, but not completed in the month. It is well nigh impossible to frame any accurate costs of the work done monthly if the returns are prepared on a cash basis.

The evolution of the Revenue basis is due no doubt to the credit system obtaining, for the Cash Account is not adequate to show the results for a given period, and so outstandings were taken into account.

In my own district I believe all the planters keep their accounts on the cash basis, so I would address my remarks especially to them.

Now I do not suppose every planter knows what is meant by a Revenue basis, so I will explain. The Revenue basis assumes that everything payable has been paid. It has for its fundamental basis a record of legal obligations incurred, not transfers of money. A planter may ask himself if I have to regard everything receivable as having been received how am I to treat local produce sales for future delivery. Often in my district a planter contracts to sell so many bushels of coffe at some future date, and receives an advance from the purchaser. In a case of this kind Sale Account should be credited at the time when the sale actually takes place, that is at the date of delivery, and at the date of making the contract to sell.

The following entries should be passed through the books.

1. Debit Cash Account with advance received from purchaser, and credit purchaser.

2. Debit purchaser with actual value of amount sold and credit Sales Account.

3. Debit Cash Account and credit purchaser with amount paid by him.

In no case should the advance given by the purchaser be credited to Sales Account.

If no advance is given, then local sales can be treated as Cash Sales.

All expenditure *incurred* in any one month should be debited to the expenditure Account in respect of that month. By way of an example, let us assume you buy in the month of July 10 tons of manure from Messrs. A. Brothers, but do not pay for it until the following month. You should debit your expenditure account for July with the cost of the manure and credit the seller. When you pay the bill, you will debit the seller with the amount you pay him and credit either your Bank or Cash Account.

If this principle is not followed, there is nothing whatever to prevent a Manager from holding back bills until he has sufficient money to pay them and passing them through his accounts perhaps months after he has received the goods. Whereas if he charges the Estate at once with the debt, he can see by his monthly Balance Sheet what his liabilities are and also know exactly what his *total* expenditure on the Estate has been up to any date. For those who keep cost accounts the advantage of this system is obvious.

I would like to say a few words on cost accounts. For a small Estate they are unnecessary, but for a planter who owns a large Estate it is sometimes very useful to be able to prepare a Profit and Loss Account in respect of each separate field. To do so, a Cost Ledger should be opened, and it should contain an account for each field. Each field can be debited monthly with the amount spent on it as per the Distribution of Labour book. All standing expenses such as salaries etc., can be apportioned against each field on the basis of the acreage of each field. At the end of crop, each field can be credited with the value of the crop taken from it. The balance of each account will show the profit or loss on each field, Cost Accounts can of course be elaborated to any extent.

COFFEE.

The Cultivation and Preparation of Coffee.

AN INTERESTING REVIEW OF THE SUBJECT OF CULTIVATION, PREPARATION AND CONSUMPTION OF COFFEE.

(*Continued*).

After-care of the Nursery.—Coffee seed usually takes about six or seven weeks to germinate, and during this time the soil must be kept moist and shaded and all weeds must be rigorously kept down. If the rainfall is insufficient artificial watering must be resorted to, or a mulch of dead leaves may be placed on the soil, but this must be removed as soon as the first seed leaves make their appearance. Shade is usually provided by placing mats, palm leaves, interlacing grass leaves or similar material on a wooden framework about 2 ft. from the soil.

When the seedling have formed two or three pairs of leaves they are pricked out into beds, prepared in a similar manner to the seed beds, at distances of about 12 in., in rows about 15 in. apart. Some planters recommend pricking out the seedlings even younger, *viz.*, before the two seed leaves have unfolded.

If the soil in the seed bed is at all dry it should be watered the day before the plants are shifted, and it is usually necessary to water them immediately after planting. The young plants must be well shaded until they have taken root. If the plants are to be grown in the plantations without shade they must be hardened to exposure by gradually removing the shade over the beds some time before they are ready for transplanting.

Grafting.—This method of propagation has been practised to some extent in Java, more especially in connection with certain hybrids raised

there. Good results have been obtained by using *C. liberica* as a stock—the plants for this purpose being raised in nurseries in the usual way—this species having a vigorous root system which is less affected by certain soil parasites, such as eel-worms, than are those of other forms. Old trees which have become attacked by coffee leaf disease or which fail to give good yields are sometimes rejuvenated by grafting. In such cases the stems are cut down to within 8 or 9 inches from the soil and two branches allowed to grow, which serve as stocks on which a hybrid or other good type of coffee is grafted.

Transplanting.

The coffee plant is ready to be planted in its permanent quarters when about a year old. At that age it will be about 12 to 18 in. high and possess the first pairs of primary branches. Several months prior transplanting, however, lining and holing must be completed. The distance of planting will depend on a number of factors: the kind of coffee grown, the character of the soil and climate, the size to which the plant is to be allowed to grow, and so on. Speaking generally, it may be said that Liberian coffee should be planted about 12 ft. by 15 ft., and Arabian about 6 ft. by 8 ft., these distances being increased when the more vigorous varieties are grown, on rich soils or in moist climates.

On good soils the holes should be about 12 to 18 in. in diameter, and the same in depth, but on poorer or stony soils they should be larger. The earth removed is sometimes placed in heap on the higher side, but some planters recommend spreading it evenly over the surface of the ground. After a time fresh soil, often mixed with manure, is put into the hole so as to form a slight mound, in the centre of which the seedling is planted.

Planting should only be commenced after the soil has been thoroughly soaked by the rains, the best time being on showery or dull, cloudy days. In removing the plants from the nursery as large a ball of earth as possible should be taken up round the roots. After planting, the earth must be pressed firmly down, and if dry weather follows one or two waterings must be given. In any case, it is necessary to shade the plants with leafy branches, or by other means, to prevent them from wilting. The whole of the planting should be completed well before the close of the rainy season in order to give the plants a chance of getting well rooted before the dry weather sets in.

It is a good plan to place a number of seedlings in pots, as these bear transplanting well even during dry weather, and may be used to fill up gaps in the lines.

Planting with Stumps.—As previously mentioned, the establishment of a plantation by means of young plants purchases elsewhere is not to be recommended, and should only be practised when it is impossible to form a nursery. Plants two to three years old are used in this case. The stems are shortened to 8 or 10 in., and the roots trimmed. The stumps are then planted at an angle of about 45° in holes prepared in the same way as seedlings. All buds which appear on the lower side should be rubbed out, and the strongest shoot on the upper surface left to form the new stem of the plant.—*Simmon's Spice Mill.*

(To be continued.)

WEST INDIAN FRUIT

Blue Mountain Coffee.

Mr. A. St. Geo. Spooner, of Jamaica, has recently furnished this Office with a useful and interesting account of the famous Blue Mountain coffee industry of that colony.

Mr. Spooner gives consideration first to the quality of the soil producing this coffee. The lands on which the plant is grown are generally very steep hillsides, and in many places the soil is now insufficient (owing to denudation), and too poor to produce profitable coffee bushes, except in the little valleys and pockets where there is still depth and suitable quality of soil. It is stated that an estate havig perhaps 1,000 acres at one time or another suitable for coffee might to-day find it difficult to maintain 100 to 150 acres. The soil is the product of the decomposition of shales, and is of no great depth anywhere, the more denuded lands being merely rotten shale, and hardly to be classed as soil at all. However the coffee which is produced is well known to be of excellent quality. The prospect of obtaining profitable crops is stated to decrease with the elevation. For best all-round purposes 2,000 to 2,500 feet is the best; higher than that, although the quality of the coffee is better, the yield is smaller, and as the rainfall is often too heavy, the trees do not always flower except a period of drought happens to come in between the rainy spells. It appears that the seasonal changes experienced during the last few years have rendered the poduction of Blüe Mountain coffee more precarious than in former years. At high elevations, namely over 2,500 feet, shade, except for the very young coffee, is not desirable; at lower elevations it is indispensable. Another effect of elevation upon the plant is seen in the case of pruning. Coffee grown at high elevations is all pruned 'short top,' whereas this pruning does not suit coffee in the lowlands. Mr. Spooner is of the opinion that the tendency of coffee at these rainy and colder elevations is to produce leaves and wood, and in order to ensure bearing well, a much more drastic pruning is needed. On the lowlands the rainfall is less, and it is desirable to have a larger tree, with a more extended root range. The pruniug of coffee at different elevations is not a difficult matter, but it is too much a question of practical judgment to allow of description in this article.

Mr. Spooner then proceeds to describe the machinery used on some of the estates as long ago as 100 years. The pulper consists of a wooden roller covered with copper (indented) and turned by a mule. The cherries are forced between the roller and a hardwood block, whilst the beans are left on the hardwood block and fall backward on to a shaking riddle through which they pass into a stone cistern. The mucilage ferments from the beans in twenty-four to forty-eight hours assisted by the water which is run into the pulper all the time and in which the pulped beans lie. After fermentation the beans are carried out and dried. When quite dry—it takes about three or four weeks to reach this condition—they are put into a circular wooden trough in which runs a great heavy wooden wheel pulled round by a mule. The 'scrunching' action splits off the parchment; the beans are then winnowed and put back again under the wheel to 'scrunch' off the silver-skin. They are then winnowed again, sized in a rotary sizer and then hand picked to reject the inferior beans of each grade

The above represents the old way of preparing coffee. The new way consists in using a much improved pulper, but constructed neverthless on the same principles as the old. Further, after drying, the beans are hulled in a machine having a coarse—threaded screw working very loosely in a coarse—threaded nut: the space between the screw and the nut is where the parchment coffee is 'scrunched.' After winnowing, the coffee passes to many different forms of sizers, which not only separate the beans by virtue of their diameters, but also—which appears more important—sizes them according to their length. In a fancy article like Blue Mountain coffee appearance counts for everything, and a low bean having a good diameter is certainly an attractive looking article. The grades in one of the largest coffee houses of Jamaica are Peaberry, Nos. 1, 2, 3, 4, and Priage Nos. 1 and 2. Peaberry is produced by weak and old trees that produce a certain proportion of cherries having only one seed, which then becomes rounded something like cowrie. That this grade ranks so high is further evidence that plant vigour and good quality in coffee do not go together, just as in the case of sugarcane cultivation, a certain degree of fertility, not too high, produces the best sugar-making juice.

According to Mr. Spooner the cultivation of the mountain coffee usually consists merely in weeding two or three times a year and pruning according to the season and soil, and irrigation sometimes every year, or once in two or three years. Agriculturally the coffee land of Jamaica seems to be greatly neglected. The tree is said to be a surface feeder, but it seems that in order to live on some of the lands, it is at present found growing on, it must have a very wide root range. The bushes are planted 4 x 4 feet on poor highlands to 6 x 4 feet on richer land. They begin bearing at about four years old. The young seedling plants are got from self-sown plants at the base of the growing bushes. No nurseries are made.

As regards yield to be expected, Mr. Spooner states 266 lb. per acre per annum is considered very good. A small yied is not more than 100 lbs. per acre per annum. Since there are 1,815 trees per acre planted at 6 x 4 feet, the yield per tree for a good crop works out at about only $1\frac{3}{4}$ oz. of coffee per tree per annum. The cherries are also measured in a box (1 foot 6 inches x 1 foot 6 inches x 1 foot 4 inches = 3 cubic feet) and this is supposed to give 1 bushel of dry coffee in the parchment or anything between 20 and 25 lb. of dried clean coffee fit for sale. Picking costs 1*s*. 3*d*. to 2*s*. 6*d*. per box (3 cubic feet) of cherries according to the crop, and a good picker in a good crop picks $\frac{7}{8}$ to 1 box per day. The finished coffee is put up in 100 lbs. canvas bags, twenty-nine of which are a mule load. In Liverpool, the price is anything from 90*s*. to 120*s*. or even 130*s*. per cwt., but it is difficult to sell quickly. It is stated that it is not uncommon to have to wait six or eight months for account sales. Financing therefore becomes difficult. Peasant coffee is bought in the cherry at from 6*s*. to 12*s*. per box. The yield of about 200 lbs. cleaned coffee per acre would be about $12\frac{1}{2}$ boxes of cherries. Mr. Spooner states that from this source the native in the coffee district derives what little ready money he needs. His principal requirements are met by the provision crops which he grows on his holding.

It appears that the mountain coffee districts of Jamaica are very sparsely populated and perhaps not 5 per cent. of the land is in any cultivation at all. It has to be borne in mind, however, that the Blue Mountain coffee of Jamaica has established a name for itself because of its good flavour, and it seems a matter for regret that this cultivation is not given greater attention.—*The Agricultural News.*

LABOUR DEPARTMENT.

Some remarks on cooly recruiting.

The old Kangany system formerly in force is the best that can be devised. For Kangany the alternative title Maistry may be read. The Kangany was originally, and in some instances still is the senior member of a family group composed of his personal relatives, to whom may be added other families drawn from villages from the vicinity of which he and his relations also come. The labour force thus formed is subdivided into a number of smaller groups, each under its Sub-Kangany: in each group so formed the family principle is further manifested, and minor headmen (not recognised as Sub-Kanganies) with their wives and children, and it may be one or more close relations have a joint liability for money advanced to them, and hold their earnings to some extent in common. In a gang of say 100 coolies, there may be very little relationship between the Head Kangany and the ultimate member of the gang—nevertheless there will be in an ideal force, some connection which leads link by link from one to the other.

The ideal in real life is seldom if ever attained. We have to be content with some approach to it, but the further away any labour connection is from the ideal I have roughly sketched above, the more unsatisfactory it will prove. A southern Kangany with a gang of coolies from the North is in an unsatisfactory state, because at any moment there may be a complete severence of the connection, there being no link at all between them.

The worst sort of recruiter, even if he may be an admirable man on the Estate in other ways, is the one who proceeds to a country where some one else has led him to believe he can get coolies. He depends on this man with whom he has nothing at all in common. The local labour Agent is asked all about the character of the man, and we will suppose there is nothing against him, in proof of which he may actually produce coolies who start for the Estate. If they change their minds on the way and abscond, who is responsible? The Labour Agent disclaims responsibility, the recruiter says he handed over the coolies which is all he said he would do, and the Kangany says the Labour Agent and the recruiter are in league against him, duped him, and supplied him with coolies who had arranged beforehand to bolt and it was all a put up job, the Manager of the Estate claims the money from the Labour Department, and the Department refuses to pay: the Estate has lost the money and no good has been done. Supposing that the coolies arrive on the Estate and work there, is it to be expected that the state of affairs will continue to be satisfactory for any length of time? No one can be sure that such a condition will not give trouble and be a source of loss at any moment and almost certainly so in the end. It is sometimes true that coolies will work pretty well with a Kangany of a caste generally recognised as a higher caste than themselves and stick to him year after year. It will usually be found in such cases that the Kangany is well known in some town or village which is the centre of the "pattikad" or a "hulli" from which the coolies come. Thus in the South, Pallars will work with Panikars, Pariahs with Pallars and nearly every one with Thevans. The fued which lies dormant, but is always ready to awaken between Maravars (Thevans) and Shanars (Nadans) must not be lost sight of. Shanars claim a position that no one else agrees to admit. They call themselves Kshattryas sometimes, which is the caste next to Brahmins. No one outside themselves will listen to such a claim, and to Maravars especially it is obnoxious, and causes in them a fury which has led to bloodshed, and often caused serious riots.

A Nadar Kangany with Thevan coolies is therefore like a man on a barrel of gunpowder, all right as long as there are no sparks flying about. When trying to form or increase a labour force, it will be well to remember the one sentence which embraces everything:—"*The foundation of a successful labour connection is the family or patriarchal idea.*" The nearer one approaches this ideal, the more chance of success, the further one deviates from it the more danger of trouble and loss.

An untried man who offers to bring coolies from some other part of the country than his own, should not be listened to. An untried man or a doubtful man who says that he has been promised coolies by some one else, of a caste other than his own, or higher than his own should be treated with the utmost caution, so far as recruiting coolies goes. The most curious case I know was a Nadan, who was promised Thevan coolies by a Mahommedan. This, in my opinion, was bound to bring all concerned to grief.

It must be remembered that each caste is divided into very numerous sub-castes. I once learnt from a Maravan not likely to be wrong, that there were 94 sub-castes among that community, and that intermarriage between these are not considered correct even now, although of late years such marriages had taken place in a few instances.

It must be remembered that the fact of a man adopting or being born into Christianity, and being well educated, makes a difference. There are many Indians in positions of great responsibility on Estates, whose ancestors were of low caste, but because of their social position, education and trustworthiness, they have gained the confidenee of their superiors, and of those who work under them as Kanganies, Sub-Kanganies and coolies. Being born Christians, they have nothing further to do with caste even if they observe certain old customs which were good enough for their forefathers and therefore good enough for them.

Many excellent rules have numerous exceptions for which allowances having been made, I advise everybody to let slip no opportunity to work, even if it is only inch by inch never away from but always towards the sound principle that "*The foundation of a successful labour connection is the family or patriarchal idea.*"

Although what I have written applies particularly to the Tamil districts, the cardinal principle is sound throughout for every S. Indian planting district.

AYLMER Ff. MARTIN,
Director.

Bangalore, 2nd December, 1915.

ONE OF THE CAUSES OF THE DIFFERENCES IN QUALITY OF HEVEA RUBBER.

The writer finds that the properties of *Hevea* rubber vary according to the tree from which the latex is obtained. This opinion is based on determinations of viscosity of rubber in solution in benzene. He established an index of viscosity and found important differences among the individual trees yielding the rubber. There also appears to be a correlation between the colour of the latex and the quality of the product. These observations are of importance in the selection of seed bearing trees.—*Monthly Bulletin of Agricultural Intelligence and Plant Diseases.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 51.] DECEMBER 18, 1915. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Secretary returned from Quilon on the 14th instant and where he had been to attend the meeting of the South Indian Branch of the Rubber Growers' Association and found on his return after five days in the train, a vast amount of correspondence that had to be dealt with. The delay in answering letters during that week is accounted for.

The contents ot this issue is varied and interesting dealing with Soils and Manures from *Nature*, and Soil Bacteria and Green Manures extracted from the *Tropical Agriculturist*.

For the same paper we are indebted for an article on Die Back in Uganda.

In the article on Rubber the Chancellor of the Exchequer's remarks on Excess Profits is well worth careful consideration.

We draw attention to the Notice under the head of "Labour Department."

The subscription to the Overseas Air Craft Fund amounts to Rs.4,008-14-0 to date and we gladly publish some correspondence sent us by Mr. F. H. Sprott, Honorary Corresponding Secretary for Coorg of Overseas Club.

The Madras Department of Agriculture have recently published Vol. IV. Bulletin No. 69 on the subject of Bees and the Fertilization of Coffee by Mr. T. Bainbrigge Fletcher, the Imperial Entomologist. Much of the contents of this Bulletin have appeared from time to time in the pages of the *Planters' Chronicle*, but the whole investigation of this subject is here gathered together in a handy and consecutive form, together with the conclusions arrived at and all Coffee planters interested in this important branch of Coffee cultivation are advised to obtain a copy of the Bulletin. It may be got from the Superintendent of the Government Press, Madras, price 3 annas.

The Planting Expert leaves Bangalore on the night of 18th December for Ootacamund to pay a visit of inspection, at the special request of Government, to the Cinchona Plantations. Mr. Anstead will also take this opportunity to pay a visit to the Nilgiri Coffee Hybridisation Plot. On his way back he will call at Coimbatore to consult the Government Mycologist on the work being done in collabaration with him on the Brown Blight of Tea and the Secondary Leaf-fall of Hevea Rubber. Mr. Anstead expects to return to Bangalore about 29th December after the Christmas holidays.

SOILS AND MANURES.

The World's Supply of Potash.

W. A. D.

In view of the scarcity of potash occasioned by the war, the Imperial Institute has issued a pamphlet (pp. 47, price 1s.) under the above title, in which a review is given of the existing sources of supply and suggestions made as to the possibility of obtaining potash from materials not hitherto worked for this purpose. The potash used in this country has been almost exclusively derived from the Stassfurt deposits, south of Magdeburg, which have been so systematically and economically worked since about 1862 that German potash, on account of its cheapness, has driven all other competitors from the market. Potash salts are essential constituents of plant food, and the greater part of the potash salts extracted at Stassfurt is used as a fertiliser; but relatively large quantities are employed in various chemical industries and in the manufacture of glass and soap.

Besides the Stassfurt Deposits, there is only one extensive deposit of carnallite at present known, and that is the Spanish deposit of Catalonia, the working of which, it is stated, has recently been commenced. This deposit has great commercial promise, and, next to those of Stassfurt, may prove to be the most important source of potash at present known. There are also deposits in India, which may prove to be of importance if they can be worked sufficiently cheaply.

All plants contain more or less potash, and the utilisation of the ash of wood, the ash of sea weeds, of beet-root residues, and similar by-products of industries in which vegetable raw materials are employed, is of importance as a source of potash, especially at a time of scarcity like the present. The burning of sea-weed and the extracting of potash from the ash, at one time an important industry on the Coasts of Scotland and Ireland, has recently shown signs of revival. From Ireland during 1913, 3,939 tons of kelp, valued at £16,631, were exported. As a rule the Irish kelp contains more potash than that produced in Scotland. At the present time the utilisation of the giant kelps of the Pacific coast is regarded by many as the most promising source of soluble potash salts in the United States. The best account of the new industry which has sprung up on the Pacific shores was given by F. K. CAMERON in a paper read before the Franklin Institute in 1913 (JOURNAL. FRANKLIN INSTITUTE, Vol. clxxvi., p. 347). According to an official estimate 6,000,000 tons of potassium chloride could be obtained annually from this source. It was shown by Balch in 1909 that the giant algae of the Pacific, the principal species being Nereocystis and Macrocystis, contain about five times as much potash as the majority of seaweeds, the average percentage on the dried weed being from 15 to 20 per cent of K_2O. Since the publication of these results various labour-saving devices have been tried for cutting and collecting the weed, and the cost per ton of weed not landed is stated to be about 20 cents.

The preparation of potash salts and iodine has also become an important industry on certain parts of the coasts of Japan, and it is stated that Japan now supplies about 80 per cent. of the iodine consumed in the United States. The weeds used on the coast of Japan are species of Laminaria, *Ecklonia cava*, *E. Bicyclis* and Sargassum, spp.

In Canada the burning of wood to ash was for several years a considerable source of potash, but in a report recently issued by the Forestry Branch Department of the Interior, it is stated that at the present day, owing to altered conditions, there is small possibility of reviving the potash industry as formerly practised. The amount of potash to be recovered from the waste from the sawmills is considered to be too small to be regarded

as commercially practicable for the mills to undertake its recovery. In most cases the only use for the ash from sawmill burners is for the farmers in the locality to apply it directly on the land.

Experiments made at Rothamsted recently have shown that the ash of hedge cleanings, consisting of grass, weeds, and clippings, contained on the average about 11 per cent. of potash, that is to say, about as much as kainit (RUSSELL JOURN. BOARD OF AGRIC, 1914, vol. xxi., p. 694). The potash is present in a very soluble form (carbonate) and is rapidly washed away. If it is to be utilised, therefore, care must be taken to protect the ashes from showers of rain while they are cooling.

A rather neglected source of potash is the soapy water used for removing grease from wool. The matter soluble in water contains potash equivalent to 5 per cent. of potassium carbonate, calculated on the raw wool, but as the recovery of potash is not remunerative unless conducted on a large scale, the wool washings are usually allowed to go to waste. On the other hand, in Belgium, France and Germany the wool suint is utilised as a source of potash; it is estimated that in the Roubaix district alone potash salts to the value of £100,000 are obtained annually from this source.

One of the most promising future sources of potash supplies seems to be the recently discovered deposits in Alsace. In 1904 deep borings were made at Niederbruck in the hope of striking oil, but instead saline matter was encountered at the depth of 1,174 feet. Since then the number of mines has increased to twelve: in 1912 the output was 137,243 metric tons, and in 1913, 350,341 metric tons. Recent reports state that the Alsatian deposits are probably continued across the Rhine into Baden.

During the past few years attention has been directed to the possibility of employing as manures, with or without previous treatment, minerals which contain potash in an insoluble form; the more important of these are alunite, felspar, and leucite. An account is given in the pamphlet of the methods which have been experimented with.—NATURE.

Soil Bacteria and Green Manures.

The following instructive article from the pen of Mr. M. Kelway Bamber is reproduced for the pages of the November issue of the *Tropical Agriculturist*.

Soil contains myriads of minute living organisms on whose activity much of the fertility of the soil depends. Without them many of the soil constituents and most manures would be of little avail to plants as it is only by their action that the constituents become available for the nutrition of crops. A cubic centimetre of soil taken from near the surface contains from 1½ to 2 millions of bacteria of many kinds, besides innumerable fungi. Below 5' or 6' few bacteria are to be met with.

Farmyard manure, guanos, cakes, bonemeal, etc., undergo decomposition by their agency and are broken down into simpler chemical compounds which can be absorbed through the root hairs of plants.

To deal with Nitrogen, practically all plants absorb this in the form of Nitrate of Lime or similar salt. This nitrate has been formed by the gradual decomposition of decaying leaves, or other nitrogenous vegetable or animal matter, brought about by the agency of certain putrefactive and other bacteria. By these the proteids are broken down into simpler nitrogenous bodies, and slowly and gradually into compounds of ammonia. The action of different types of bacteria now begins, and the ammonia compounds are oxidised first to nitrous compounds by very minute mobile bacteria belonging to the genus Nitrosomonas and finally to nitric acid by bacteria belonging to the genus Nitrobacter.

The nitric acid as it is formed combines with a base in the soil, usually lime, or with the potash of wood ashes if such have been applied to form

calcium or potassium nitrates, both of which salts are soluble in water and are readily absorbed through the root hairs of plants.

For nitrification to take place several conditions must be fulfilled, otherwise the bacteria cannot act. These are, briefly, a suitable temperature about 70° F being best; ample air such as is found in a well-drained soil, sufficient moisture, and the presence of a free base such as lime to combine with the nitric acid as it is produced.

Besides the nitrifying bacteria mentioned above, there are several de-nitrifying bacteria which act in the reverse way reducing nitrates to nitrites and these to ammonia and finally to free nitrogen, which escapes into the air and is lost. These are found chiefly in fresh dung and old straw, and can only act under anaerobic conditions, *i.e.* with little or no air so that on well-drained and cultivated land they are of little importance, and can cause but a slight loss of nitrates through their agency.

An important group of soil organisms are now known which have the power of using the free nitrogen of the air to form the complex nitrogenous compounds of which their bodies are largely composed.

By their continued action, they gradully enrich the soil with nitrogenous material, which after nitrification, becomes available for the use of the higher plants.

The higher plants cannot fix nitrogen, but the *Bacterium clostridium pasteurianum* common in most soils is able to utilise free nitrogen under anaerobic conditions and an organism known as *Azotobacter chroococcum* and others closely allied to it can utilise the nitrogen under aerobic condtions.

All these need to be supplied with carbohydrates or other carbon compounds which are contained in humus or plant residues or in some instances from carbohydrates manufactured by minute green Algae with which they live in close union.

Among the nitrogen-fixing bacteria, a certain class enter into association with the roots of leguminous plants such as Beans, Peas, Dadaps. Tephrosias, etc.

These bacteria are present in almost all soils and enter the root hairs of their host plants and gradually stimulate the production of a characteristic growth or nodule on the rootlets. These nodules are found to contain large numbers of a bacterium termed *Bacillus radicicola* or *Pseudomonas radicicola*. For a time they multiply, obtaining the necessary nitrogen for their nutrition and growth from the free nitrogen of the air, and the carbohydrates from their host plants.

The nodules increase in size and for a time are rich in nitrogen, which gradually decreases as the organisms are transformed into soluble nitrogenous compounds, which are conducted to the developing roots and tissues of the hosts. After the death of the plants and subsequent decay of the roots some of the unchanged bacteria are left in the soil to infect a new leguminous plant.

These nitrogen fixing bacteria have been cultivated on artificial media and many attempts have been made to utilise them for practical purposes, by inoculating soils with the special type required by the crop to be grown.

The results are always negative, probably owing to the soil already containing the particular organism in abundance.

Applications of more or less pure cultivations of bacteria of the azotobacter group have been made to poor soils in order to provide a cheap supply of nitrogen, but such applications are still in the experimental stage.

In Ceylon and the East generally the advantages of the azotobactor group of nitrogen—fixing bacteria have been utilised on a large scale for many years. First for the improvement of tea in Assam by the growth of the San tree *Albizzia stipulata* as a green manure, and later by the growth

of numerous herbaceous and tree form leguminious plants such as Crotalarias. Tephrosias and Phaseolus species, and Erythrina, Albizzia and Acacias amongst the tea, rubber, cocoa and other tropical products in Ceylon.

All the plants utilised on a practical scale at the various elevations in Ceylon are known to develop nodules to a greater or less extent, according to the type of soil and the assistance given to the plants by cultivation and manuring of the products amongst which they are grown. In old, worn out soils from which the surface soil had long been removed by wash it was often difficult to establish any form of green manuring, probably partly due to the almost complete absence of the special bacteria required, and for crotalaria the addition of a little soil from where the species grew luxuriantly was found very successful.

In the case of Dadaps, a brief form of propagating this plant is gradually being established at higher elevations and in most unpromising soils by first planting them in sheltered ravines, allowing them to grow into trees and utilising the branches for cuttings, which can be planted immediately, before fermentation has set in. Here the bacteria are not required for the establishing of the plants, but in all cases examined they appear later and assist in the production of a large amount of green organic material for the subsequent benefit of the tea or other product concerned.

These green manuring crops, during their growth compete with the main product for the moisture and mineral matter required for their growth, also to a certain extent for their nitrogen requirements. Leguminous plants, however, obtain much of their nitrogen from the air in the manner described, a feat impossible to orninary plants. The decay of the branches and leaves after lopping therefore add to the soil a large amount of nitrogen, which with the carbohydrates and cellular matter is gradually changed into humus by the putrefactive bacteria, and the proteid bodies are slowly converted into ammonia compounds and these into nitrites and nitrates, which are then directly assimilable by ordinary plants.

Coffee.

The market is still dull and lifeless although there has been a fair home trade enquiry, but stocks are so far in excess of consumption that the general position remains unaffected. The following, taken from *The Times*, is interesting as showing the effect of the restrictions on the export of Coffee:—

"Figures now available show that, though exports of coffee from the United Kingdom were prohibited as from June 20th last, Holland and the Scandinavian nations have been receiving large supplies from the producing countries direct. During the three months July, August, and September, Holland imported 526,000 bags, which total compares with annual consumption of about 700,000 bags. Excluding shipments through the United States, Norway, Denmark, and Sweden together took 786,000 bags from Brazil, whereas the total annual consumption of the three countries is about 1,080,000 bags. In the meantime stocks in this country have risen from 768,000 bags on July 1st to 552,000 bags on October 1st, while the annual consumption is only about 240,000 bags. Since Holland and Scandinavia have evidently no difficulty in securing all the supplies they want the chagrin of British firms at being unable to export some of their surplus supplies can quite well be understood."

Great advantages to the London export trade were expected as a result of the elimination of the Hamburg market, but, as will be seen from the above, far from gaining the Hamburg trade, we have temporarily and possibly permanently lost our own.—*The Produce Markets' Review.*

DIE-BACK IN UGANDA.

Almost a hundred examples of this Coffee trouble have been examined in the laboratory during the year. In many estates this die-back has caused a serious loss of trees, and in others a serious loss of bearing wood, and therefore, of crop. On the older estates, it was most common when *Hemileia* disease was at its worst and afterwards, and there is always a certain amount of it on all plantations.

The tips of affected branches blacken, and the leaves fall; the berries very often remain on the branches, but they become brown and do not mature. At first, only a few branches are affected. These may occur at different levels in the centre of the tree. A further stage shows the gradual drying-up and death of practically all the primary branches, situated above the oldest primaries at the base of the stem and below the young green apical shoots. Thus is produced a tree with a lower mass of well developed leafy primary branches, an upper crown of fresh green shoots, and an intermediate area which is naked, barren, and unsightly, and consists of projecting primaries which have lost all interest in life.

This condition is the result of physiological causes, and is not due to fungoid attack. It was thought at one time that "die-back" trees were affected by a bark disease, caused by a fungus of the nature of the *Corticium* which attacks *Hevea* and other crops, but this idea has been entirely departed from. The following two paragraphs may perhaps give an explanation of Uganda Coffee "die-back.."

During the first years of the Coffee-tree's growth, the basal primary branches, which are the oldest, are enabled to make good secondary growth and thoroughly to establish themselves. Therefore, when flowering and bearing commence, they are able by their own efforts, and with the help of their secondary branches, to ripen their crop and survive the ordeal. The young apical primaries bear no crop, and they, having no extra strain put upon them and having to hand their full share of sap, continue to grow and increase. The intermediate mass of primary branches--the ones which die back--find themselves unable, of their own unaided efforts, to ripen the large maiden crop they invariably bear. They are not yet well-established, and they collapse under the strain put upon them. Inspection of a coffee tree in this condition shows that some of these primaries succeed in ripening their whole crop and then die, while others, after ripening only a part of the berries, give up the effort to do any more. The dead branches are lost for ever to the tree. Others which survive may linger on for some time, with, as a rule, only one apical pair of leaves. In this way, a gap in the symmetry of the tree is made, and, should the same effects follow the incidence of the next flowering season, an exceedingly useless and unsightly tree is produced.

The Coffee "die-back" is thus to be regarded as the direct effect of a form of over-bearing, and, on this assumption, the following measures are recommended.

Where "die-back" is common, and it is desired to adopt remedial measures, these should take the form of stumping affected trees. The cut should be made through the stem at the top of the basal portion which bears the healthy primary branches. A new sucker can be raised from this stump and the tree restored in time to its normal shape.

Preventive measures are strongly recommended to those who are able to adopt them. They consist in the prevention of over-bearing by the branches under discussion by relieving them of their maiden crop. The young berries should be pulled and rubbed off the trees. This operation is

best performed within a month after flowering. If it is carried out too soon after the flowering, a set of new buds will be produced, and if it is delayed until the berries are well-grown, and the bearing branch shows signs of sickness, the benefit of the operation is lost. The harm is already done, and the branch is in the grip, so to speak, of the "die-back."

The carrying out of this operation on a fair-sized estate will undoubtedly prove costly, but it will most likely require to be undertaken only once, and that during the second or third year of the plant's life, and only on those branches that attempt to bear on green wood. Expense and loss of crop (the latter being negligible because the lost berries would not, in any case, come to maturity) will be repaid by the development of naturally and symmetrically branched trees, and the subsequent evenness of crop borne. Secondary and other branches can be replaced, but lost primaries *never can be.*

In this connection, it is to be regretted that the operations of removing from young trees all tender superfluous growths, of systematic pruning of older trees, and of keeping clear around the main stem a cylindrical vertical passage a foot in diameter by removing secondary branches, are not more frequently carried out. Good cultivation is also necessary.

The fungi found on "die-back" trees are *Periconia Byssoides Pers*, *Fusarium coffeicola*, P. Henn., *Phoma sp.* (probably new). *Fusarium sp.*, *Tubercularia sp.* and a *Colletotrichum.* The first-mentioned form and the two species of *Fusarium* were also found on young trees killed by lightning. The *Phoma* and the *Tubercularia* were found only once. None of these species is constant in its presence on "die-back" branches, and other imperfect forms found only very occasionally are not suggestive of parasitism. These fungi are undoubtedly only saprophytic.

The foregoing remarks do not bring into the question of the prevalence of die-back a factor which has undoubtedly had a great influence upon it, the baneful effects of *Hemileia* disease—the loss of leaf surface and the consequent reduction of the working efficiency of the weakened tree. Branches which never bore or attempted to bear any crop have died back solely because of their loss of leaves and the general low condition of the parent tree caused by the demands made upon it by the necessity for renewal of a lost or damaged leaf-system. Die-back, again, is favoured when weeds have been allowed to interfere with the nutrition of the trees, where the soil is poor, and where a period of drought has been experienced, the last being the case in certain districts immediately after the epidemic of *Hemileia* which lasted over 1913. Like *Hemileia* itself, it is not at present so much in evidence as it was during 1913 and the earlier part of 1914. In other words, many trees have "recovered," but the planter is still faced with the fact that owing to the loss of primary branches, he cannot take from his trees the full crop they ought to yield.—ANN. REPT. DEPT. OF AGRIC., UGANDA PROTECTORATE, 1915.—*The Tropical Agriculturist.*

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended October 9 ...	5,092,337	6,707,153	3,108,133	1,074,285
For 41 weeks ended October 9 ...	227,217,256	236,148,363	44,717,574	42,827,307

—The Produce Markets' Review.

RUBBER.

This product, as in the past, continued to be the chief article of export, and notwithstanding the crisis, practically the same quantity, less by a few tons only, was exported in 1913 as had been in 1912, *viz.*, approximately 3,500 tons.

It is predicted by those who should be in a position to know, that vine or wild rubber must of necessity be the principal item of export from the Congo for some years to come.

I do not, however, agree with the above prophecy.

In the first place, when the Government found that the price of rubber had fallen to such an extent as to make it practically impossible for traders of this colony to derive a profit in the European markets, a law was introduced amongst other measures already referred to, whereby the maximum price to be paid to natives for rubber was fixed at 1 fr. 50 c. per kilo. Such law, however, whilst imposing no hardship on the native, has had a deterring effect upon him, with the result that production of rubber has suffered in consequence.

There appears however, no reason, should other industries be exploited and prove successful, why the natives should not, especially if they are well paid, abandon the collection of rubber, to a certain extent at any rate, and turn their attention to such other work as offers possibly better inducements. The Government and also private enterprises are already devoting their serious attention to such products as gum copal, palm oil, palm nuts, groundnuts, silk (possibly) and wood in which this country abounds, but are handicapped at present by heavy rates of transport.

The situation as regards rubber cultivated on plantations remains much the same as that of 1912, and it is not anticipated that there will be any significant move in regard to the export of this product for some time.

Most favourable reports are, however, to hand from various plantations of the progress which is being made in this direction, and of the healthy and steady growth of the *Funtumia elastica* (Ireh), the *Manihot glaziovii* (Ceara) and the *Hevea Braziliensis*, in such parts of the Congo as they are known to thrive, *viz.*, the Ireh generally, the Ceara in the Mayumbe district particularly, and the *Hevea* in most parts, but particularly in the equatorial districts.

Great attention is being directed by the Government to the propagation of young trees, and I am given to understand that it is their intention to take over certain old concessions which have fallen through, by virtue of the concessionnaires having failed to fulfil the conditions imposed under the concession rights, and start these afresh.

New plantations, I believe, are also under project by the Government. This would appear to indicate that the State at any rate has confidence in the future of the cultivated plant.—*Consular Report, Congo.*

Excess Profits.

Mr. McKenna in his most recent statement acknowledges very fully and candidly the claim of shareholders in rubber-planting Companies to a higher return than 6 per cent.:—

"If you take a rubber Company, it must be assumed to have an ordinary fair return on its Capital. *In the case of a Rubber Company that is new*, that has been in existence only five or six years and is only beginning to get a return on its Capital for the first time, perhaps, in 1914, its

profits would be in excess of what would be received in any two out of the three preceeding years. But whatever profits it gets for the first time, we think ought to be considered in relation to what would be a fair and generous return on the capital of that Company. *When a man invests in a Rubber Company he expects throughout the period of his investment to get perhaps 8 or 9 or 10 per cent.* I have never had an investment in a Rubber Company in my life, and I do not know, but am quite sure it is more than six. He expects to get as much per cent. per annum. That is to say, the produce of this capital is going to be a certain amount, and in the first year in which there is a good profit he expects a certain amount in order to recoup him for the years in which that Company would have had no return. The question will go before the Board of Referees, who will settle what would be a fair return, if that was an ordinary Company, during the first years of its life, upon the Capital invested. We cannot now fix a rate of return as fair to a rubber company which is in its sixth year. We have not the materials before us. If the Committee is satisfied with the *personnel* to the tribunal whose names will be given to the House I think that we might safely leave the matter to them, and I hope that the Committee will be prepared, with this explanation, to pass from this question. *If a rubber Company were brought out with a prospect of paying only 6 per cent. nobody would subscribe. Six per cent., I assume, will not be the rate for rubber Companies.*"

A previous declaration of the Chancellor was that when a rate had been fixed by the Board of Referees it would be a single rate applicable to every concern engaged in the particular industry. We have already pointed out that the effect of this is more favourable to Companies with large amounts of watered capital than to conservatively capitalised and managed companies, but no doubt the anomaly is unavoidable under the present scheme, as also is the other complaint that the young and developing Companies will bear the brunt of the taxation, and that the older companies will be relatively immune.

Opinions may be divided as to the allocation, without fuller guiding directions, of the work of deciding upon the interest line for each industry to the Board of Referees.—*India-Rubber Journal.*

CEYLON.

Rubber Exports in July.

The following statistics of the exports of rubber of domestic production from Ceylon during the month of July, and the seven months ended July, 1914, and 1915, have been extracted from official returns issued by the Ceylon Government :—

	July, 1914.	July, 1915.	Jan.-July, 1914.	Jan.-July, 1915.
	lbs.	lbs.	lbs.	lbs.
United Kingdom ...	1,487,846	2,005,264	9,335,985	16,152,827
United States ...	500,717	1,900,490	4,473,335	8,376,991
Other countries ...	602,532	206,079	3,897,336	1,499,866
Total exports of rubber of domestic production ...	2,591,095	4,111,833	17,706,656	26,029,684

—*The Board of Trade Journal.*

LABOUR DEPARTMENT.

Simultaneous Execution of Civil decrees in South Canara District.

The result of much consultation and some expense in getting Counsel's opinion is that Subscribers to the Department should cause Civil decrees which have to be transferred for execution in S. Canara District, to be sent to the District Court at Mangalore and not to any Munsiff's Court as has been the custom heretofore. Immediately orders are passed for the transfer of the decree, a telegram should be sent to that effect to "Upasi," Mangalore and confirmed in writing. It is important that intimation of the transfer should reach the Labour Department's office in Mangalore before the decree reaches the Court. Copy of the decree and Copy of the execution petition in the court of first instance must also be sent without any delay to enable the matter to be dealt with and to meet the difficulty now experienced of defaulters dodging about from Taluk to Taluk and thus evading Civil Warrants.

AYLMER Ff. MARTIN,
Director.
Labour Department, U. P. A. S. I.

An Asset of the Future.

THE COOLY CHILD ON ESTATES.

Elkaduwa is setting an example to other Districts in a matter which has come to be regarded as of great importance to estates, where every healthy cooly child is an asset of the future. Most of the estates in this district (writes our correspondent) are now employing maternity nurses and where practicable two estates employ one nurse for both. It is to be hoped that the practice will soon become universal in the island.—*Times of Ceylon.*

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously acknowledged	25,986	8	0
Mr. G. A. Marsh	500	0	0
„ E. N. House	50	0	0
„ A. R. Pigott	100	0	0
„ R. Lescher	25	0	0
„ E. W. Fowke	50	0	0
Messrs. Volkart Brothers	1,000	0	0
Mr. H. C. Westaway	300	0	0
„ F. Bissett	100	0	0
„ R. P. Roissier	100	0	0
„ A. R. St. George	100	0	0
„ J. S. Wilkie	30	0	0
„ J. M. Wilkie	20	0	0
„ W. A. J. Milner	20	0	0
„ W. H. G. Leahy	20	0	0
„ E. D. Atkins	20	0	0
„ W. H. F. Lincoln	30	0	0
„ R. Copland	50	0	0
„ W. Tippetts	5	0	0
„ W. Deane	100	0	0
„ H. Clifton	10	0	0
„ A. H. Robb	45	0	0
„ E. C. Walker	15	0	0
Total Rs...	28,676	8	0

CORRESPONDENCE.

Hallery, Mercara, P. & T. O., N. Coorg.,
10th December, 1915.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—At Mr. G. R. Pearse's suggestion, I write to ask if you will very kindly publish in the *Planters' Chronicle* the enclosed two papers, which I have received from the Honorary Organiser of the Overseas Club. I think perhaps they may be welcome to those who are doubtful about subscribing to the Overseas Air Craft Fund.

It has been put forward to me as the chief objection to the fund, that "if the Government wants Aeroplanes, they will be acquired whether they are presented or not."

I will let these papers and the fact of the ever-increasing value of Aeroplanes in the war speak for themselves, as to whether or no the gift of an Aeroplane would be welcome to the Government. Upto 5th October twenty seven (27) Aeroplanes have been presented to the Royal Flying Corps at a cost of £45,000.

I am, dear Sir,
Yours faithfully,
F. H. SPROTT,
Honorary Corresponding Secretary for Coorg
of Overseas Club.

ENCLOSURES REFERRED TO ABOVE.

Buckingham Palace.

5th Augut, 1915.

Dear Sir,—I beg to acknowledge the receipt of your letter of yesterday.

The information which it contains has been communicated to the King, and it is needless to say His Majesty is gratified to learn of the liberal spirit with which the Over-seas Dominions have responded to the appeal from the Overseas Club for funds to form an Imperial Air-Craft Flotilla.

Yours very faithfully,
STAMFORDHAM.

E. Wrench, Esq., Honorary Secretary,
The Overseas—Club.

War Office,
London, S. W.
12th August. 1915.

114/Colonies/106. (C. 1.)

Sir,—I am commanded by the Army Council to acknowledge the receipt of your letter of the 4th August and to inform you that they have been much gratified to hear of the prompt response to the appeal issued by the Overseas Club to its members and friends in all parts of His Majesty's Dominions overseas, which has already permitted the presentation of ten aeroplanes to the Royal Flying Corps. The Council desire that an expression of their great gratitude should be transmitted to all those who have so generously contributed to this result,

I am, Sir,
Your obedient servant,
B. B. CUBITT.

The Honorary Organiser
The Overseas Club,
General Buildings,
Aldwych, W. C.

Yercaud, Shevaroys,
13th December, 1915

THE EDITOR,

Planters' Chronicle.

Corrections.

Dear Sir,—In my article on Cash v. Revenue basis of Estate Accounts published in your paper last week, you have omitted in para 5 the words "and everything receivable has been received" after the words "The revenue basis assumes that everything payable has been paid." Also in the last line of the same para "and at the date of making the contract to sell" should read "*Not* at the date of making the contract to sell."

Yours faithfully,

GUY TURNER.

TEA.

Indian Tea.—At the auctions over 60,000 packages were offered. A considerable amount of unattractive Tea was included and 8,500 packages were withdrawn. The commenest kinds declined a halfpenny and the better grades also usually sold in buyers' favour. The best demand was for good liquoring Fannings, which generally realised previous prices. Medium Darjeelings, which have recently shown excellent value, attracted more attention. For next week 55,000 packages are in print. In Calcutta 40,000 packages were offered, and only 1,000 were taken out. The quality showed a slight improvement, and prices were rather firmer.

Ceylon Tea.—The offerings brought forward on Tuesday were smaller. The competition was good for all useful and finer liquoring sorts, but the enquiry was more limited for the lower medium and common descriptions, which were mostly easier. In whole leaf kinds the price of clean common black leaf was 9*d.* to 9¼*d.*, but some stalky Pekoe Souchongs sold as low as 8½*d.* The finer breaks of broken Pekoe realised firm prices, and although quotations were no lower for the commoner sorts, there was more obtainable from 9¾*d.* to 10*d.* At the public sales 25,258 packages were brought forward, of which about 1,650 were withdrawn.

China Tea.—A small public sale was held on Wednesday, when about 1,000 packages were offered. The demand was fairly brisk and nearly all the Teas were sold. Business privately has been more general, the value available in Monings has attracted buyers and a fair trade has resulted. Ichangs and Keemuns from 1*s.* 2*d.* to 1*s.* 6*d.* have also been sold, and as the quantity of really good Tea is not large, operators have been selecting Tea for stock. Those distributors who make a speciality of self drinking China Tea must not be tempted to sacrifice quality to save ½*d.* or 1*d.* per lb. Certain sections of the discriminating public are always willing to pay a good price for fine Tea, and it is a fatal policy to lower quality and cause dissatisfaction and eventual loss of customers.

Java Tea.—Only some 4,000 packages were offered, and the market was irregular and sometimes easier.—*Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. X. No. 52.] DECEMBER 25, 1915. [PRICE AS. 8,

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

This issue is published a day before Christmas and the Editor wishes all his readers the Compliments of the Season. With the world all around a camp it would be out of place to wish them a Merry Christmas. Probably there will be more merriment in the trenches in the face of the enemy than round the domestic hearth. With savage hatred filling nearly every heart, it is the merest hypocrisy to fill a bumper to Peace on Earth and Good Will towards all men. But at the same time we are no countenancers of depression. Where the few of us collect together let there be a sober joy. Depression will do no good and alter nothing.

We publish an interesting account of the tour of the Scientific Officer in Malabar, and the deduction he draws from Manuring should bring satisfaction to the heart of every rubber planter.

We publish the Proceedings of the South Travancore Planters' Association and that of the North Mysore Planters' Association. We hope all Associations, through their members, will join the European Association. The latter Association moved a resolution with regard to the Pest Act and the Secretary, U. P. A., is circulating a copy of that Act to every planter, advising each to make himself familiar with the provisions of that Act. It is most important.

At the late Committee Meeting of the S. I. Branch of the Rubber Growers' Association some interesting letters were read regarding the Research Scheme in Ceylon and that of the Imperial Institute, and the great value of research being generally recognised. We reprint from the *Scientific Monthly* the first portion of an article by Professor T. Brailsford Robertson of the University of California on the Cash Value of Scientific Research. It is a very interesting article and will be read with pleasure. Coming as it does just before the taking over of the U. P. A. Scientific Department by the Government of Madras, it has an added value that is very *à propos*.

We draw attention to a letter from Mr. Day, Deputy Director, Labour Department, which will receive the support it deserves from all subscribers to the Labour Department.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Tour in Malabar.

Leaving Bangalore on 10th November I made a tour in Malabar and had the pleasure of visiting a number of Rubber Estates. From there I proceeded on tour to Peermade and on my way through Mundakayam had an opportunity of inspecting some manurial and tapping experimental plots. On 1st December I met the Members of the Mundakayam Planters' Association and discussed manurial and other Rubber problems with them.

Several manurial experiments are being conducted with Rubber in these districts, some on an estate scale and others on definite experimental plots. It is difficult to interpret correctly the results which are being obtained and a good deal of difference of opinion seems to prevail on the influence of manures upon the yield. In the case of Rubber this must necessarily be so unless the results are judged over a longer period of years than we yet have figures for. This crop differs from others, like Tea and Coffee, where the whole crop in any one year is taken from the plots or fields under experiment. In the case of Rubber the whole crop is not taken, but only a portion of it, and an estimate must be made of the portion left in the trees.

The experiments with different manures on the experimental plots have not been running long enough to justify the publication of any figures, or the coming to any definite conclusions, but there is a decided increase in yield in several cases. Against this has to be set the opinion of several planters that they have not when manuring large fields obtained a sufficient increase in crop to pay for the manures applied.

While there appears to be a difference of opinion on this point it is generally agreed, however, that manures do increase the girth and growth of trees, and improve their general health, enabling them to recover more quickly from the attacks of secondary leaf-fall and other diseases. This in itself probably pays for the manures, but it appears to me that if the actual increase in crop is to be judged it can only be done over a period of years during which the whole of the original bark on the tapping area is removed, and that results should be considered in area of bark removed and not in yield per tree.

Suppose we start with two similar trees and that one is manured and the other is left unmanured, and that the tapping system adopted is one cut on one third of the tree started at such a height that it takes two years to tap out each third section. Now suppose for the sake of argument that the girth of each is 18 inches where the first cut is put in and 21 inches at ground level. A third section will then consist of a strip of bark 6 inches at the top and 7 inches at the bottom, and we will say 18 inches long. The area of this is roughly $6\frac{1}{2}$ x 18 square inches = 117 square inches, and this is removed in two years. Now we change over to another third section, but meanwhile the tree has increased in girth. In the case of the unmanured tree let us suppose that at the end of two years its girth at 18 inches from the ground is 21 inches and at ground level is 24 inches. Now our second third section will be an area of bark, 7 inches at the top and 8 inches at the ground and 18 inches long, or 135 square inches. This is removed in two years. Finally we come to the last third section which we will suppose to be an area of bark, 8 inches at the top and 9 inches at the bottom and 18 inches long or 153 square inches. In the six years we have removed 405 square inches of bark and obtained a yield of x lbs. of rubber, or x 405 lbs. per square inch of bark.

Now take the manured tree. In the first two years we remove exactly the same area of bark as in the unmanured tree, *viz.* 117 sq. inches and unless the manure has had the effect of increasing the rubber content of the latex we shall get much the same yield. Hence it is unfair to judge the effect of manures on the yield unless we expect this to happen. But at the end of the second year when we change over to the second third section we shall probably find that, owing to the manure, the girth of the manured tree instead of being 21 inches at 18 inches from the ground as in the case of the unmanured tree, is say 24 inches, and at the base 27 inches instead of 24, so that our second third section gives us an area of bark to remove of 153 square inches instead of 135. In the last third section also we may have a girth due to the application of manures of 27 inches at 18 inches from the ground and 30 inches at the base and so an area of bark to remove consisting of 171 sq. inches. Thus in the six years we shall have removed 441 sq. inches of bark instead of 405 sq. inches and got a yield of y lbs of rubber, or y/441 lbs per sq. inch of bark.

Now we are in a position to really judge of the effect of the manures on the yield: y/441 may be greater than x/405. Even if it is the same the yield obtained during the six years will be greater as there was a bigger bark area to tap due to the manure.

It would appear to me, therefore, that the effects of manure on the yield cannot be judged fairly over a short tapping period and that in considering such effects the area of untapped bark with its rubber content must be considered and credited to the manure account.

When the proposed reorganisation of the Scientific Department is brought into actual being and Rubber Experiment Stations are established it is proposed to interpret manurial experiments on these lines unless in the meanwhile some practical planter can point out a fallacy in the argument, and full discussion of the point will be welcomed.

The important factor in manurial experiments appears to me to be the increase in growth of girth of the tree, and as a rule no figures are kept or observations made upon this point.

The question of the right kind of fertilisers to apply and how best to apply them is one which needs far more experimental work and careful observation than has been done at present.

There are in the Rubber Districts under review two systems adopted in the application of manures. One is to broadcast it and fork it in, or a variation of this to fork first and when the forked land is again full of roots to broadcast the manures and lightly work it in.

The other system is to open a series of trenches along the rows of the trees and in these place the fallen leaves and the manure and then to allow them to silt up. On sloping land this also serves the purpose to stopping wash to a great extent.

There is much to be said for both methods. In the first an even distribution of manure through the soil is obtained and thus an even distribution of the root system. In fact it is an application of the rule to manure the soil and not the tree which I personally as a rule favour.

The result of the second method is to concentrate the roots of the trees in the pits. If one of these pits is opened at the end of say a year it will be found to be full of Rubber feeding roots. This being so the pits must not be cleaned out, but when fresh manuring is to be done new pits must be opened. Moreover a smaller dose of manure

is required in this second system than in the first. Another advantage of this pit system undoubtedly is that wash is prevented, fallen leaves are easily collected and put back in the soil, while the roots can be made to feed deeper. This latter point with our long drought is undoubtedly not to be lost sight of.

I noticed that on one estate at least when marking out a third of the tree for a system of one cut tapping a true third was not delineated, the central channel and the guide line being made parallel to one another, the area of bark removed being defined by a parallelogram. As the tree is not a cylinder but a section of a cone this marking obviously does not give a real third section. If the top cut is put in where the tree is say 18 inches in circumference, it is 6 inches long. But at the base the tree will be say 21 inches in girth so that when the last cut is reached it will be 7 inches long, and not 6 inches, and the area of bark removed will be represented by a figure the long sides of which are not parallel. In marking the tree after putting in the central channel a point six inches to the left should be found at the top and 7 inches to the left at bottom and these two points joined to form the guide line. I was told that this is rudimentary in most places but call attention to it as it appears to have escaped notice in one place at least.

The effects of secondary leaf-fall are very apparent on most estates and many conflicting points about this disease remain to be cleared up. The investigation is being continued by the Government Mycologist and myself and during the 1916 monsoon we hope to conduct some field experiments which will indicate a line of practical control. Meanwhile thanks are due to all those who so kindly sent in answers to the list of questions circulated. The mass of information thus acquired, when sorted out, will prove of great help to us.

Pink disease appears to still be prevalent in most estates. I hope before long to have at my disposal figures to show the effect on this disease of annual application of Bordeaux Mixture.

On many estates thinning out is being done in a systematic way and still more will in many cases be necessary. In some cases when patches have been thinned rather drastically light has been let in and weeds have made their reappearance. In such cases there is an excellent opportunity for the use of a green dressing. On one young estate I had the pleasure of seeing, an excellent cover of *Crotalaria* had been established. This would undoubtedly prove of great benefit to the soil, which was laterite, when dug in. Moreover it was preventing wash on the slopes and if sown next year thickly on the upper sides of the silt pits which had been opened so as to form hedges it would be still more effective in this respect.

RUDOLPH D. ANSTEAD,
Planting Expert.

London Tea Returns.

	Duty Paid.		Export.	
	1914.	1915.	1914.	1915.
	lbs.	lbs.	lbs.	lbs.
For week ended October 23 ...	5,714,084	4,901,190	3,580,925	1,309,364
For 43 weeks ended October 23 ...	238,616,896	247,137,826	51,520,073	45,263,031

—*The Produce Markets' Review.*

DISTRICT PLANTERS' ASSOCIATIONS.

South Travancore Planters' Association.

Proceedings of the General Meeting held at Quilon Club, on Saturday, 11th December 1915, at 10-30 a.m.

PRESENT:—Mr. L. G. Knight (Chairman), Messrs. S. A. Marten, A. W. Leslie, A. W. Upcher, R. J. A. Moore, J. Stewart, R. Ross, and T. P. M. Alexander (Honorary Secretary). *Visitors*:—Messrs. Fletcher Norton, J. A. Richardson, H. M. E. Howson,—Bisset.

The Minutes of the last meeting were read and passed.

A hearty vote of welcome was accorded to Mr. Fletcher Norton the energetic Secretary of the U. P. A. S. I.

SRI MULLAM POPULAR ASSEMBLY DELEGATE.—Read letter from Mr. Cook, and telegram from the Chief Secretary. It was proposed that the Honorary Secretary write Mr. Cook explaining how matters stand and ask him to be Delegate.—Carried.

ELECTION OF DELEGATE FOR S. T. P. A.—Proposed by Mr. Leslie and seconded by Mr. Upcher that Mr. Marten be the second Delegate—Carried.

FOREST LAND REGULATIONS.—Read letter from Mr. Richardson, when it was decided to leave the matter to the C. T. P. A. as a deputation was being sent to discuss matters with the Dewan.

EUROPEAN ASSOCIATION.—Mr. Richardson was asked to say a few words about this Association, pointing out its benefits, etc. It was resolved that this Association be asked to give its support. A list was passed round when all members present joined. It was proposed that the Honorary Secretary write other members asking them to put their names down for membership in the European Association—Passed.

Read letter from the Secretary, U. P. A. S. I., regarding the Rubber Growers' Association. It was decided by the Committee before that Mr. Stewart be our representative.

(Signed) T. P. M. ALEXANDER,
Honorary Secretary.

North Mysore Planters' Association.

Proceedings of the Quarterly General Meeting held at Balehonnur, on the 13th December, 1915.

PRESENT.—Messrs. W. H. Reed, (President), C. H. Browne, H. G. Bonner, C. Danvers, C. P. Reed, E. W. Fowke, R. G. Foster, C. Crawford, F. I. Morgan, C. C. Kent (Honorary Secretary).

By Proxy.—Mr. S. L. Mathias. *Visitor.*—Mr. G. V. R. Frend.

The minutes of the previous meeting were read and confirmed.

LABOUR RULES.—The revised Labour Rules were put to the meeting and passed. A vote of thanks was accorded to Mr. C. P. Reed for attending the meeting of delegates at Chickmaglur.

DASSARA DELEGATE'S REPORT.—Mr. F. I. Morgan read his report as follows:—

"Gentlemen, I am afraid my report of the Dassara Proceedings—as far they affect us—will be a very brief one. On arrival in Mysore and speaking to the Dewan's Secretary, I found that any subjects our Association wished to bring before the Assembly, had to be sent in at least three months beforehand, and also the address, so the only thing I could do was to obtain a private interview with the Dewan. And I was fortunate enough to be allowed to present my address to the General Assembly.

You will remember the three points you wished me to bring up were:—(1) State of the Roads (2) Delay in obtaining sanction of Darkasts for land (3) Insufficient punishment of coffee thefts.

About Darkasts for land, I mentioned to him the three glaring cases of delay that Messrs. Hunt, Danvers and Fowke had experienced.

In the coffee stealing cases I unfortunately only had one to tell him about, namely the Honeyvale case last year. I wrote to Mr. E. C. Kent about particulars of his case, as requested, but regret to say I received no reply.

Both these petitions the Dewan said he noted and would look into them. About the roads, I really think some impression has been made. I gave him particulars about Mr. Brown's complaints of no work being done during the past on the Sallebile-Balehonnur and Sallebile-Sringiri roads. The Dewan said that these roads would shortly be done if it was not already being done and that more work was going to be done on all the roads. I also mentioned the Baum-Ghat Road, that this particularly should be kept in good order. The Dewan suggested that more Toll Gates should be built at various points to supplement the grant for up-keep of the roads, as in his opinion insufficient money was granted. But I speaking for the Planters as a body told him, I did not think we should agree to this, as we considered enough money was allowed but it was not spent on them.

I think, Gentlemen, this is all I have to report. I did what I could in the limited time and I have to thank you for electing me as your delegate."

A hearty vote of thanks was accorded to Mr. Morgan for attending the Assembly.

COFFEE STEALING ACT.—The correspondence relating to Mr. Morgan's coffee stealing case, from the Chief Judge and the Deputy Commissioner, was read and discussed. Apparently from various causes a revision of the judgment given was impossible but the Association hoped that the representations made will have effect in the future. Great exception was taken to the delay, amounting to 6 months, in providing Mr. Morgan with a copy of judgment, Mr. Morgan having put in an application for the same on the 11th March 1915, which was not supplied until the 9th September 1915, the excuse being that there was no copying papers available but these were seen to have been applied for on the 11th March, 1915 but were not supplied until the 6th September, 1915. Further comment is needless.

ROADS.—Proposed by Mr. H. G. Bonner, seconded by Mr. C. Danvers "That this Association do ask H. H. the Maharaja's Government through the Superintending Engineer, to have the road running from Balehonnur to Margundi and from Margundi to the Balur Post, widened and made into an 18 feet metalled road, as since the Margundi bridge was built, the traffic along this road has increased enormously and in some places the present road is hardly broad enough for two carts to pass each other."

The proposal was carried unanimously and the Honorary Secretary was instructed to write to the Superintending Engineer, Northern Circle on the subject.

WATTIE KHAN DISPENSARY.—Proposd by Mr. H. G. Bonner, seconded by Mr. F. I. Morgan "that this Association do ask the Medical Department to establish the proposed Dispensary at Wattie Khan as soon as possible as it is very much needed, besides serving from 1,500 to 2,000 coolies working on the surrounding estates, it would serve a large number of villages and paddy cultivators, ranging from Margundi to Kotagahara"—Carried.

The Honorary Secretary was instructed to write to the Senior Medical Officer, Bangalore, pointing out that if the building was not started at once, the labourers and material would be unavailing until next season.

NEW VARIETIES OF COFFEE.—In 1910 our delegate to the U. P. A. brought up the matter of the desirability of new varieties of coffee being introduced and the result of it was the starting of an Experimental Station on the Nilgiris which has so far been a disappointment, and at any rate of no practical use in so far as the obtaining of seed goes.

The situation now is, if anything, more serious than it was, and our Association feels very strongly the necessity of beginning at once to experiment with seed from all quarters.

It was resolved "That the Scientific Officer be approached on the immediate desirability of procuring seed from any suitable source for experimental purposes by members of this Association."

MISCELLANEOUS.—Read letter from Mr. E. C. Kent and it was noted with satisfaction that he wished to withdraw his resignation for the Kutchen Huckloo Estate.

Read letter from the Secretary, U. P. A. S. I. re proposal made by Mr. J. J. Murphy, Chairman of the Mundakayam Planters' Association, and the Honorary Secretary was instructed to reply to the same.

Read letter from the Secretary, U. P. A. S, I. and copy of the proposed Pest Act. It was resolved to refer the matter to the Scientific Committee of the U. P. A. S. I.

A subscription list for the Mysore Imperial Troops and the Hoskoppa Museum was circulated.

(Signed) C. C. KENT,
Honorary Secretary.

LONDON COFFEE RETURNS.

	Home* Consumption.		Export.		Stock.	
	1915.	1914.	1915.	1914.	1915.	1914.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
For week ended October 23 ...	264	259	246	430	34,470	19,135
For 43 weeks ended Oct. 23...	16,147	12,647	19,884	20,639	—	—

*The Home amount contains a proportion for Export delivered by cart.
—*The Produce Markets' Review.*

CASH VALUE OF SCIENTIFIC RESEARCH.

BY

PROFESSOR T. BRAILSFORD ROBERTSON

UNIVERSITY OF CALIFORNIA.

There can be no doubt that the average man and woman in Europe and America to-day professes a more or less nebulous feeling of respect and admiration for the scientific investigator. This feeling is not logical for very few have ever met or seen a scientist, fewer still have ever seen the inside of a scientific laboratory, and hardly any have ever seen scientific research in the making.

The average man in the street or man of affairs has no very clear conception of what manner of man a "scientist" may be. No especial significance attaches in his mind to the term. No picture of a personality or his work arises in the imagination when the word "Scientist" is pronounced. More or less indefinitely, I suppose, it is conceded by all that a scientist is a man of vast erudition (an impression by the way which is often strikingly incorrect) who leads a dreary life with his head buried in a book or his eye glued to telescope or microscope, or perfumed with those disagreeable odors which, as everybody knows, are inseparably associated with chemicals. The purpose of this life is not very clear, but doubtless a vague feeling exists in the minds of most of us that people who are willing to pursue such an unattractive career must be worthy of admiration, for despite all the triumphs of commercialism, humanity still loves idealism, even idealism which seems objectless because it is incomprehensible.

From time to time the existence of the scientific man is recalled to the popular mind by some extravagant headlines in the daily press announcing some utterly impossible "discovery" or some extravagantly nonsensical dictum made by an alleged "scientist." The "discovery" was never made, the dictum never uttered, but no matter; to-morrow its place will be taken by the latest political or matrimonial scandal, and the public, with excellent good sense, will forget all about it.

From time to time, also, there creeps gradually into the public consciousness a sense that *something has happened*. Brief notices appear in the press, at first infrequently and then more frequently, and an article or two in the popular monthlies. The public becomes languidly interested in a new possibility and even discuss it, sceptically. Then of a sudden we are awakened to the realisation of a new power in being. The X-ray, wireless telegraphy or the aeroplane has become the latest "marvel of Science" only to develop in a very brief period into a commonplace of existence.

Many indeed are aware that we own these "marvels" to Scientific research, but very few indeed, to the shame of our schools be it spoken, have attained the faintest realisation of the indubitable fact that we owe almost the entirety of our material environment, and no small proportion of our social and spiritual environment to the labors of scientists or of their spiritual brethren.

Long ago, in ages so remote that no record of them survives save our heritage of labour well achieved, some pastoral savage, more reflective and less practical than his brethren, took to star-gazing and noting in his memory certain strange coincidences. Doubtless he was chidden by his tribal leaders who were hard-headed men of affairs, skilled in the questionable art of imposing conventional behavior upon unruly tribesmen. But he was an inveterate dreamer, this prehistoric Newton and the fascination of the thing had gripped his mind. In due time he was gathered to his fathers, but not before he had passed on to a few chosen ones the peculiar coincidences he had observed. And thus from age to age coincidence was added to coincidence and the result of all this "unpractical" labour was, at long last, a *calendar*. Let who will attempt to estimate the cash value of this discovery; I will not attempt the impossible. I will merely ask you to picture to yourselves humanity in the condition of the Australian Aboriginal or of the South African Bushman; devoid of any means of estimating time or reason save by the daily passage of the sun, and I ask you "supposing that through some vast calamity, a calamity greater even than the present war, humanity could at a stroke evolve a calendar, would it be worth while?" I for one think it would.

The evolution of the calendar is not an inapt illustration of the methods of science, and of the part which it has played in shaping the destiny of man. Out of the unregarded labours of thousands of forgotten men, and a few whom we now remember, has sprung every detail of that vast complex of machinery, method and measurement in which to-day we live and move and have our being. In all ages scientific curiosity guided by the scientific discipline of thought has forced man into new and more complex paths of progress. Lacking the spirit of research, a nation or community is merely parasitic, living upon the vital achievements of others, as Rome based her civilization upon the civilization of Greeks. Only an indefinite and sterile refinement of the existing environment is possible under such circumstances, and humanity stays stationary or sinks back into the semibarbarism of the middle ages.

The few scattered students of nature of that day picked up the clue to her secrets exactly as it fell from the hands of the Greeks a thousand years before. The foundations of mathematics were so well laid by them that our children learn their geometry from a book written for the schools of Alexandria two thousand years ago. Modern astronomy is the natural continuation and development of the work of Hipparchus and of Ptolemy; modern physics of that of Democritus and of Archimedes; it was long before biological science outgrew the knowledge bequeathed to us by Aristotle, by Theophrastus and by Galen.

If, therefore, we ask ourselves what has been the value of science to man, the answer is that its value is practically the value of the whole world in which we find ourselves to-day, or, at any rate, the difference between the value of our world and that of a world inhabited by Neolithic savages.

The sweeping nature of this deduction may from its very comprehensiveness fail to carry conviction to the reader. But concrete illustrations of the value which scientific research may add to our environment are not far to seek. They are afforded in abundance by the dramatic achievements of the past century of human progress, in which science has begun painfully and haltingly to creep into its true place and achieve its true function.—*Scientific Monthly.*

(To be continued.)

CORRESPONDENCE.

Labour Department, U. P. A. S. I.,
Deputy Director's Office,
Coimbatore, 17th December, 1915.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—Allow me through your columns to request subscribers to this Department, who require information about Malayalees, to always make a point of stating the paramboo or "house" name of the maistry or cooly.

Without this information, it is extremely difficult to trace Malayalees. If subscribers are unable to spell the name as it is pronounced to them, it will suffice if they get the name written for them in the vernacular and forward it to me.

Enquiries concerning Malayalees should be accompanied by the names of the Cooly's Paramboo, Amsom, Desam, Taluq and if possible Post Town.

Yours faithfully,
E. H. F. DAY.
Deputy Director,
Labour Department, U. P. A. S. I.

SOUTH INDIA PLANTERS' WAR FUND.

	Rs.	A.	P.
Amount previously acknowledged	28,676	8	0
Mr. H. G. Bonner	20	0	0
„ R. G. Foster	30	0	0
Messrs. Anapura Coffee Works Co., Ltd. ...	300	0	0
Total Rs...	29,026	8	0

OVERSEAS AIR CRAFT FUND.

Amount previously acknowledged	4,008	14	0
Mr. P. M. Wilkins	50	0	0
Total Rs...	4,058	14	0